

The Iron Age

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The Wheeler Surface Condenser.
Comparatively little improvement has been effected in connection with surface condensers since they were first brought into use, and many objectionable features can still be found, such as unequal expansion and contraction of tubes, rupture of tube-heads, leaking and giving out of packing and joints, "crawling" of tubes partially out of their heads, and others. Difficulties also are experienced from unequal distribution of steam over the cooling surfaces, so that parts of the condenser are hot while other parts are cold, insufficient vacuum and liability of the circulating water to leak into the steam space and mix with the feed-water, thus defeating the very objects for which surface condensers are intended.

The Wheeler Surface Condenser, which the Lighthall Mfg. Co., of 97 Liberty street, New York, are introducing, is the result of years of practical experience and experiments. It is claimed to have none of the above objections and to possess the necessary qualifications combined with sound practical features. The tubes are so arranged that they are free to expand and contract without the use of packings of paper, wood or similar materials; in fact, no ferrules, followers, washers or packings of any kind are employed. Plain screw-joints only are used. The tubes are straight, of seamless brass tubing, and carefully tinned inside and outside. They can be easily and thoroughly cleaned, as their form and the means of fastening them readily permit this. The tube-heads, moreover, do not have to be removed from the main part of condenser for the cleaning or repairing of tubes. The pressure (and likewise the temperature) of the exhaust steam as it enters the condenser is reduced to a minimum, and is then uniformly distributed over the cooling surfaces. This, together with a perfect circulation of water in the tubes, produces a more uniform temperature in the condenser, making one portion as efficient as another, and economizing the amount of circulating water and cooling surface. The water of condensation, it is claimed, passes from condenser at the hottest temperature possible. The circulation is very active and thorough, and, consequently, a comparatively small amount of circulating water is required. This feature gives a marked saving in the capacity and power necessary to work the pump.

A section of the condenser is shown in the accompanying engraving. The exhaust steam from the engine, entering the condenser through the nozzle A, comes first in contact with the perforated scattering plate O which protects the central portion of the upper tubes from the deteriorating effect of the direct impingement of the steam. The steam, expanding in the spacious top of the condenser, reduces its pressure and temperature before it comes in contact with the cold tubes. The steam, as soon as condensed, passes to the bottom and flows through the nozzle B to the air pump. It will also be noticed that there is ample room in the bottom of the condenser for the water of condensation, so that it cannot come in contact with the cold tubes; the hot water therefore passes out at the highest possible temperature—according to the vacuum. In that case the water of condensation will be chilled by contact with the tubes, and consequently give cold feed for the boilers. The circulation of the condensing water is as follows. It is pumped into the compartment F through the nozzle C, and enters the smaller tubes of the lower section, as shown by the arrows. After traversing the smaller tubes the water returns through the tubes of the upper section (in the same manner as just described) into the compartment G; thence it passes into compartment H by the passageway E. The water then passes through the tubes of the upper section (in the same manner as just described) into the compartment I, and finally passes out of the condenser by the discharge nozzle D.

The upper part of the engraving shows one of the small and large tubes in section. The small tube M is expanded into the screw-head N, which latter screws into the head K. This small tube ends within a few inches of the cap G of the large tube L, thereby giving ample space for the water to reverse its direction before flowing back through the annular space between the two tubes. The end of the large tube that screws into the head J is drawn thick, so that coarse, deep threads and a slot can be cut; this latter is similar to the slot shown in N, which admits a screw-driver tool for screwing up or unscrewing tubes from the tube-heads. When it is necessary to remove the tubes for cleaning or repairs, both small and large tubes can be drawn out from the same end of the condenser. After removing the small tube the large tube is unscrewed and drawn through the hole left by the removal of the screw-head of the small tube, this hole being a little larger than the thick end of the large tube. As an evidence of the great efficiency of the Wheeler condenser we find it stated that carefully conducted tests have shown the maxi-

mum amount of steam capable of being condensed per square foot of surface to be nearly 200 pounds per hour. This excellent result is ascribed to the effective circulation of the condensing water in the tubes, making them more efficient as cooling surfaces than is usually the case.

Some manufacturing and other establishments frequently suffer from the annoyances of scale and deposit in their boilers, occasioned by the use of muddy river water. By the use of a good surface condenser this trouble, to say nothing of the expense and danger to the boilers, can be avoided, and at the same time a saving of fuel effected. There are also many places where impure or objectionable water not suitable for feed purposes abounds, and which could be utilized with great effect for condensing purposes. In all such cases surface condensers may prove of the greatest advantage.

Oxygen in Metals and Alloys.*

BY PROF. A. LEDEBUR.

It is generally known that several metals, when melted, absorb more or less oxygen from the air, or from the gases produced by combustion, with which they are placed in contact. About the fact itself there can be no doubt, so far as silver, copper and iron, with a very small proportion of carbon in it, are concerned. The question arises, What is the condition of the oxygen that enters into

The great excess of free metal prevents a more higher oxide from being formed, since the metal itself would act as a reducing agency to bring that combination back to the first degree of possible oxidation.

In the case of copper, as well as in that of iron and nickel, no other oxides can be supposed to be formed but protoxides. On this very ground I have never been able to understand why so many metallurgists have admitted on principle that sesquioxide of iron is dissolved in molten iron. Oxygen thus fixed by a metal produces a notable change in its leading properties. If oxygen that is simply dissolved becomes impossible, in consequence of the sputtering, to obtain a metal that is perfectly homogeneous, dense and free from honeycombs. The more rapidly and instantaneously the gas is set free, the more perceptible are these inconveniences. In this respect the oxygen dissolved in silver produces a much more injurious effect than hydrogen dissolved in other metals—than, for instance, in steel, whence it always escapes rather slowly. If a metal that dissolves oxygen be alloyed with another metal in which oxygen can be fixed in the state of the stable chemical combination, the escape of gas and the consequent sputtering must be suppressed, or at least reduced, when the metal becomes solid. This is really done when copper is alloyed with silver; the phenomenon shows itself more forcibly still, if, instead of copper, zinc be used, which is more readily oxidized. However, the sputtering of silver is not always

combination existing in a metallic bath. Take, for example, cast iron, the carbon of which, in combining with the oxygen of oxide of iron, forms carbonic oxide which is readily set free. Something similar happens in the case of nickel being cast. In melting black copper the oxide of copper reacts upon the sulphuret of copper so as to cause SO_2 to be set free, and so on. It stands to reason that very small proportions of gas can produce a very considerable influence, owing to their immense expansion at the temperature to which they are subjected.

My own experience goes to show that these reactions are not necessarily short-lived. They spread over a period of more or less duration, which depends on the degree of affinity between the oxygen on the one hand and the metalloid and metal on the other, as well as on the relative proportions of these substances within the bath. The greater the difference in the affinities the quicker the reaction; the less abundant the active compounds are in proportion to the mass of the bath the longer the reaction must necessarily last. In other words, the exchanges in the metallic baths follow the same laws as the double decompositions in aqueous liquors. The precipitates that may form in this last case are formed within a lapse of time varying with the dilution of the reagents, and when the double decomposition shows itself by change of color the actual process does not show all at once. If a drop of very dilute chloride of iron be added to a solution of ferro-cyanide of potassium, 30 seconds or more may elapse before

amples. In all these operations the desired object can only be achieved by using an excess of the reagent, and in this, as in the preceding cases, the whole of the oxide in existence can be decomposed only after the contact has lasted a very long time at the melting point. Just as there will always be small quantities of oxide remaining in highly-carburized iron, and small quantities of sulphur in copper containing oxide, so there will also be traces of oxide of iron found in iron containing manganese, and traces of oxide of copper in phosphorized copper or bronze. In some descriptions of steel containing from 0.14 to 0.37 per cent. of manganese and from 0.12 to 0.32 per cent. of carbon I have found as much as 0.012 to 0.03 per cent. of oxygen combined with iron. Examples of phosphorus or manganese bronze still containing oxygen will be given in the sequel.

Since it was first found that small quantities of oxygen are often retained in solid metal, great efforts have been made to find the exact proportion of this oxygen. Although many experiments have been made on the subject, the number of analyses to which credence can be attached is too limited for this metallurgical problem to be looked upon as solved. We cannot shut our eyes to the fact that, owing to the difficulty of finding the exact proportion of oxygen in the presence of the great excess of free metal, and in default of methods of analyzing suited to a number of single metals or alloys, it is as yet impossible for us to accurately ascertain such proportion of oxygen in more than a very few simple metals or alloys. In the case of harder metals that are subjected to a filing or drilling process, the first obstacle in the way of an accurate analysis is the fact that all the tools without any exception have a layer of grease on them. When filings or shavings are heated in a test tube they always emit a more or less pungent smell of burned grease. The only means of getting rid of this grease is to hold the file or bit in a fire first, but by so doing a slight layer of oxide is produced on the surface of the tool, which oxide mixes itself up more or less with the filings or shavings. As far as the analysis itself is concerned, one out of two methods may be chosen. The metal experimented on may be brought up to red heat in a current of pure, dry hydrogen, for the purpose of collecting and weighing the water contained in the metal. This is the first method.

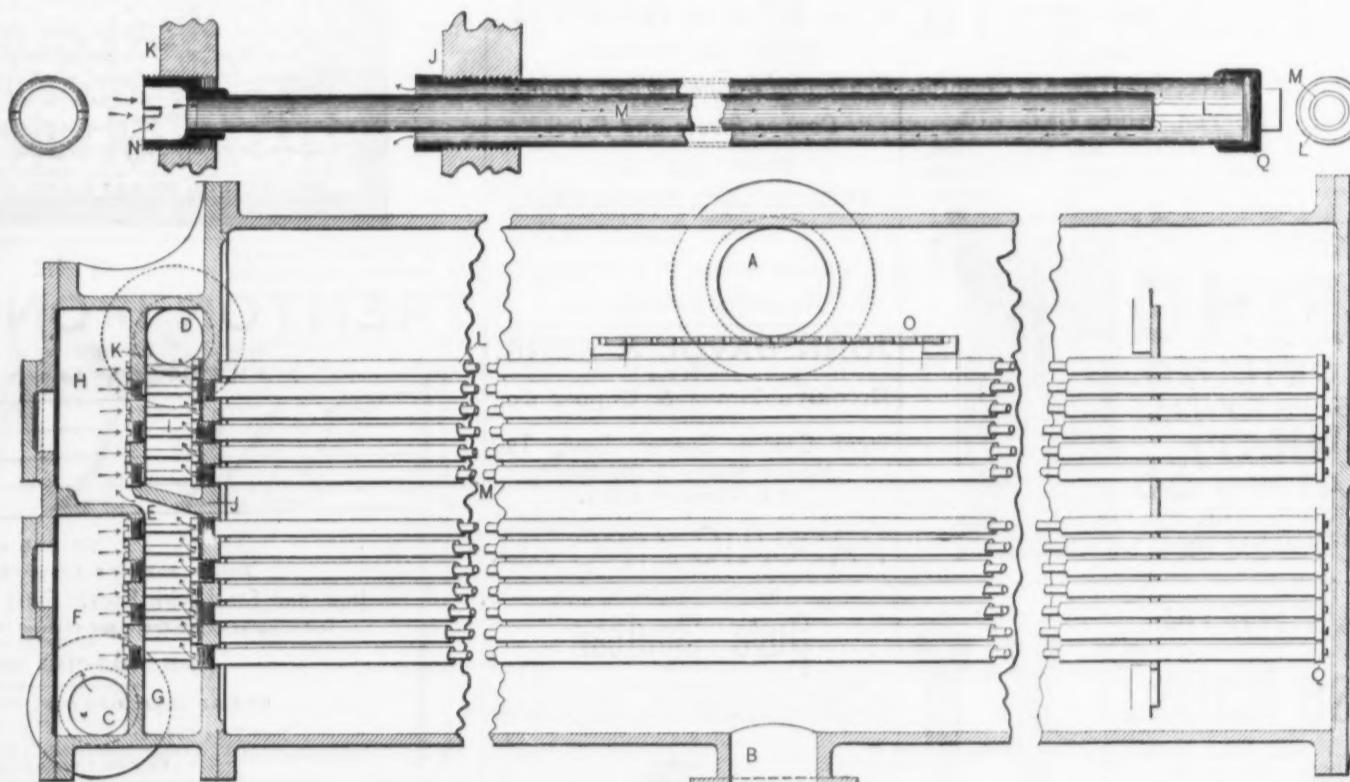
The second method rests on the tendency possessed by certain solvents to attack and dissolve the free metal, leaving its oxygenated combination insoluble. When the metal under operation and all the substances accompanying it are reducible by hydrogen, and the proportion of all the oxygen existing therein in any one form is to be ascertained, this second method is obviously the best. However, as Hampe has shown, the results of this method are not conclusive as regards the repetition of the oxygen among the different substances dealt with. As a matter of course it cannot be applied in the case of metals that are

not reducible by hydrogen; nay, if one of these metals is mixed with but a small proportion of reducible metal, there is still a likelihood of the return being inaccurate, for the irreducible oxide may resist the hydrogen, or, as stated heretofore, be but partly reduced, against its will, as it were. Thus, for example, the aggregate quantity of oxygen contained in iron can only be determined by calcination if there be neither manganese nor silicon therein; otherwise there is good reason for apprehending that part of the oxygen remains hidden in the shape of oxide of manganese or silica. The fact that the addition to molten steel neutralizes the injurious effect of sulphur (which it is well known is similar to that of oxygen) in the same way, without removing the sulphur from the bath (as proven by analysis), makes it appear likely that this action is based rather on the formation of a compound between oxygen and manganese than upon any real elimination, although the reduction of the manganese contents, always observed, points to an elimination.

(To be continued.)

C. L. Strobel, of Pittsburgh, Pa., has patented a process of manufacturing eye-bars having enlarged ends and a smaller shank or body between such ends. Heretofore the ends of the bar were heated and worked while the body was cold, which would produce a weakening of the neck, especially in steel. The entire bar had therefore to be restored to its normal condition by annealing the same. To overcome these difficulties the inventor forges on a billet or slab enlargements of approximately the fini-hed shape of head, and then reheat the blank so formed and roll it to the required length and form without subsequent reheating. Thus the metal of the bar is brought to its final shape while the entire bar is in a uniformly heated condition, and consequently the formation of any injurious strain is avoided.

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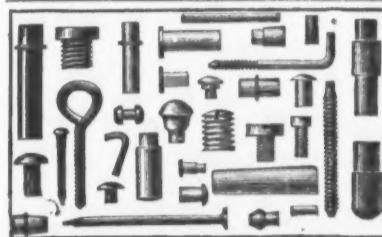




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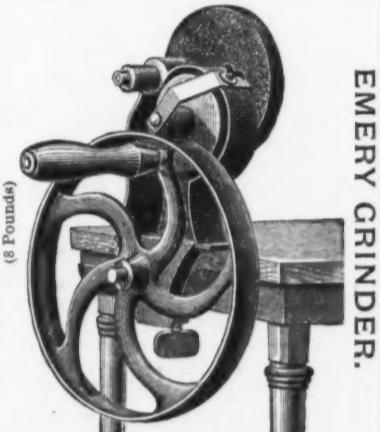
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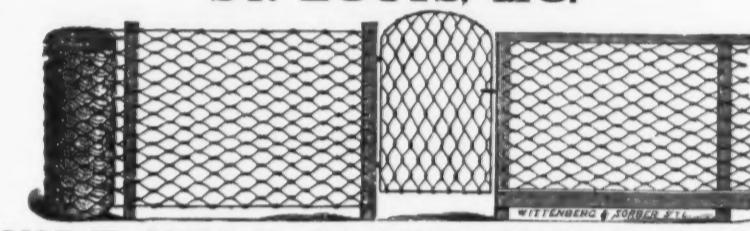


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January 7, 1886.

THE IRON AGE.

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Successors to LLOYD & LINDSAY,
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Special Wheels for Furnace and Mine Cars.

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Pig Iron,
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Special for Axles, Best Neutral and Common.

Particular attention given to Iron for Special Purposes.

Plate and Sheet Steel,
Every description of Light Plates and
Sheets of Steel.

Plate and Sheet Iron,
Best Bloom, Tube, Cleaned, Best Refined,
Skelp, Blue Annealed and Common.

James Moore, rolling-mill machinery, re-
ports business far behind that of last year, and all at exceedingly meager figures. He has scarcely any work on hand, and feels dubious about any improvement so far as he reads the present situation.

Israel Johnson, Jr., & Co. report that busi-
ness has not measured up to last year's, and prices have been exceedingly low. They have

maintained their standard quality of work, how-
ever, and by doing so have been com-
pelled to refuse considerable business which

could have been secured by lowering the
grade and competing with inferior goods.

Inquiries have been coming in very freely

during the last few weeks, but actual orders

are still scarce. They base any expectation of
new business only on the hope that Congress
will assert its intention not to meddle with

existing tariff laws.

Diebeld & Eisenhardt have been excep-
tionally busy during the entire year, chiefly

on special machinery, and have still a large
amount of work of that kind unfinished.

The demand for drop hammers, which is

one of their specialties, is picking up con-
siderably, and promises still greater activity

during the coming year.

C. C. Newton is doing a fair amount of
work, having considerable yet on hand for

the Worthington Pump Works, of Brooklyn,

N. Y. Many inquiries are being received,

and on that fact he bases the hope of a better
business shortly, though strong competition

still keeps prices down.

L. B. Flanders Machine Works (Pedrick

& Ayer) say they have done much more
work during this year, and at the present

time have a large amount on hand. Affairs

with them lead them to expect and believe

there will be plenty of business during the
coming year.

Diebel Mfg. Co. say orders under way
indicate a continuance of the fair business

they have been doing for some months back.

Their specialties in emery grinders are meet-
ing with favor, and they are disposed to

feel very sure of a busy season the coming

year.

Goodell & Waters, wood-working ma-
chinery, find that business for most of the

year will not measure up to the same time

last year, but the few months just ending

make much better showing, leaving them

with considerable work still on hand. Many

inquiries are coming in, and the prospect for
new business is quite bright.

L. Power & Co. think they have

done considerably more business this

year than they did last in wood-working ma-

chinery, but at reduced prices. The outlook

is satisfactory because of the amount of

JUSTICE COX, JR. CHARLES K. BARNES.

JUSTICE COX, JR., & CO., Agents for

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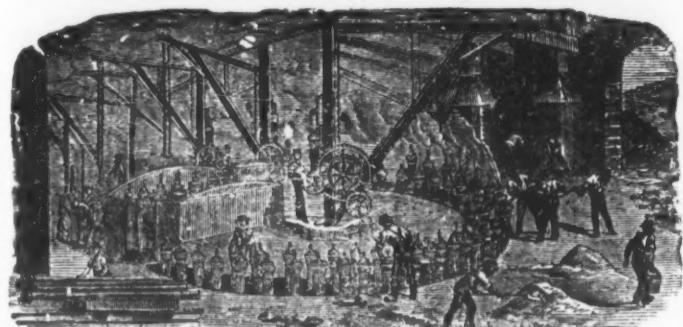
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STEEL INGOTS, Best Stock, Furnished to Order.

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We wish to give special attention to making Cast Steel Rolls of all sizes, Mill Gearing wherever Cast Steel is suitable. Also Cranks, Cross Heads, Shafts, &c., for Steam and Blowing Engine construction.

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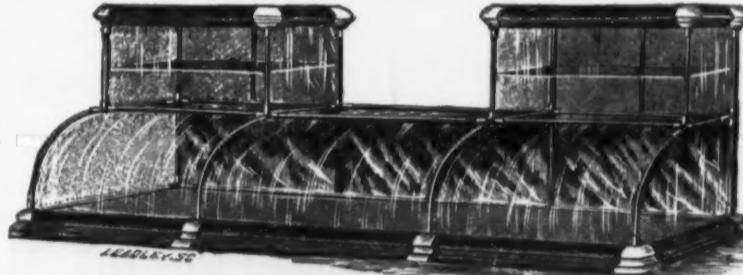
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FIG. 190.

FIG. 209.

FIG. 70.

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work on hand and the apparent necessity for new work as indicated by the receipt of a great many inquiries for prices and other details; they look for a busy spring trade.

George V. Cresson, shafting and pulleys, says he seems to have been particularly fortunate in having been quite busy during the entire year. He has run full force and time, and has at no time laid off any of his hands for want of work. Besides his odd orders, he has quite a large amount of work upon contracts—one with Leedom & Co., carpet manufacturers, for their new mill at Bristol, Pa., and another for the new building of the Puck Publishing Co., of New York. He feels assured of plenty of new business for some time to come.

Thomas Wood, shafting and pulleys, reports his business in this line as having been quite dull during the entire year, and prices barely allowing them to come out whole. He fails to find a single fact upon which to express any expectancy of better times in the near future.

Stokes & Parrish, elevators, &c., say they have turned out fully as much work as during 1884, but low prices have cut down the aggregate amount. Great competition has kept prices away down, and for this reason also they do not expect any material advantage in the near future. They have a great deal of work in hand, and their correspondence leads them to expect plenty for some time to come.

Morse, Williams & Co., manufacturers of hoisting machinery, &c., report favorably of the outlook, although the year's business has been somewhat of a disappointment on the whole. Competition has been unusually keen, and the tendency to cheapen cost at the expense of quality has kept them out of a great deal of work. They have done a large business, nevertheless, and at this time have orders on their books from North Carolina, Georgia, Tennessee, Massachusetts, Maine, Canada and other distant points, besides a large amount from New York, Pennsylvania and adjoining States. They purchased and since midsummer have occupied the very extensive premises formerly owned by Martin Landenberger & Co. They also brought from E. W. Bliss, of Brooklyn, the drawings and patterns of the Waldron rotary engines, which they are building and expect to sell largely in connection with their hoisting machinery, as they are specially adapted for work of that work.

R. B. Siegel, manufacturer of blacklead crucibles, says business has been very good during the entire year, and that the amount is largely in excess of 1884. Orders are coming in very freely. Much business is being offered which he cannot accept because of a disposition to force prices down. His aim is to make the best quality of work, and contend for prices that will warrant it. Two contracts (for 40,000 crucibles in one case, and 12,000 in another) have been declined during the last week because he could not meet price offered and keep up his standard of quality. Prospects for good business are bright, and he is about to put in more machinery and otherwise enlarge his facilities.

Main Belting Co. have done about a fair average business, but, as in other cases, low prices have prevailed throughout the entire year. They consider the outlook more encouraging than it has been for some time, and are running up to their full capacity, with a good many inquiries from new sources. This company make the largest belts in the world, one in warehouse at the present time being 90 inches in width. In addition to the home trade, they are gradually working into foreign countries, strength, durability and cost of their belts enabling them to meet competition from any source.

Alexander Bros., leather belting, say a comparison of this with last year's business shows about the same volume, but covers a larger number of customers, and accomplished only by greater efforts than ever before. The limited consumption and low prices made these efforts necessary to prevent running behind. Considering the feeling exhibited by their general trade, they are constrained to believe there is



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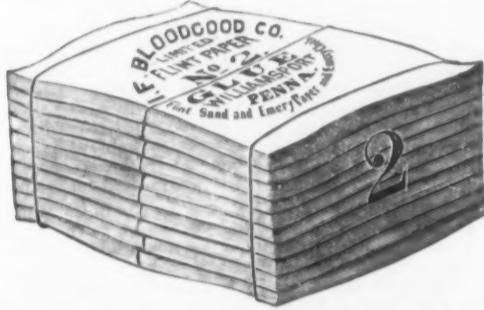
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Flat Wood,
Gang Edger,
Ginsaw,
Gulleting,
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Hand Equaling,
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Handsaw Taper, single-cut,
Handsaw Taper, double-cut,
Handsaw Taper, slim,
High Back,
Hook-Tooth,
Knife,
Knife Blunt,
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Mill,
Mill Blunt,
Mill Pointing,
Pillar,
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Reaper,
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Round,
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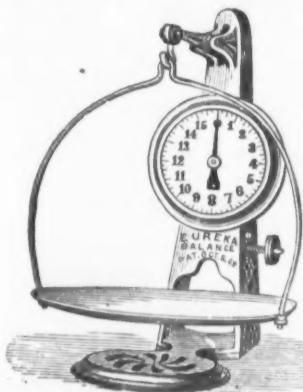
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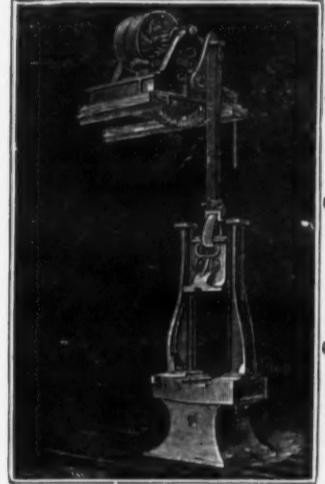
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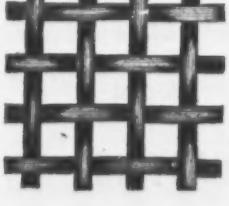
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Annual Review of the British Iron and Steel Trades.

(From Our Own Correspondent.)
LONDON, December 21, 1885.

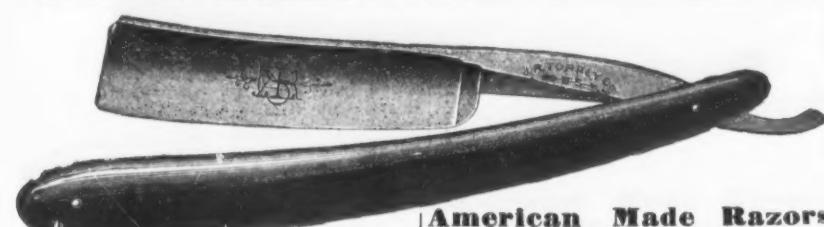
The year now closing can scarcely be said to have been disappointing to the majority of those engaged in the British iron and steel trades, seeing that a disappointment implies a promise, and the opening of 1885 certainly was not of a promising character. The previous twelve months had passed away almost "unhonored and unsung," even if occasionally regretted, and the early part of 1885 brought no change worthy of mention. As a matter of fact, the absence of change has been one of the marked characteristics of the whole year, for which reason, if no other, the present annual review is much briefer, and possibly more uninteresting, than the similar contributions of some previous years. Taking this year as a whole, however, it is possible, I think, that in some cases it has not been quite so unsatisfactory as 1884, while in other (and probably more numerous cases) it has been even more wearisome and disastrous than any of its four or five immediate predecessors. In the more satisfactory examples just alluded to the experience of the recent past has been utilized to the full in the way of economizing production, while those who have been constantly worried have found no means of surpassing their former efforts in that direction. To the majority of manufacturers in the iron and steel trades, therefore, it is safe to state that 1885 has been a year of anxiety either as to employment or selling prices. Where there has been a fair amount of work, prices have been so low as to leave scarcely a safe margin of profit, while in other cases there has been the utmost difficulty in securing orders even at the barest quotations ever known in the modern records of British metallurgical operations. Throughout the whole of the twelve months competition has been fierce and unsparring. The lowest bidder has generally gained the order, and only the most meager attention has been paid to quality as a measure of value. In a few instances, where quality has been an imperative necessity, this has not been so, of course, but the general run of commercial transactions has served to demonstrate that the necessity of the times has known no law but cheapness. On the other hand, it is tolerably certain that the low values which have obtained have been the means of sustaining the volume of business, which would otherwise have been on a much smaller scale, unless, indeed, it is invariably true, as is asserted, that extremely low prices are of no benefit whatever to anybody. Be the cause what it may, however, it appears to be certain that in many departments of our iron and steel trades the complaints heard from time to time during 1885 have been more in respect of selling values than the turnover; hence we may assume that much of our plant has been kept in good condition, and our labor has not suffered so much in proportion as our capital. That the latter has had a very inadequate return in many branches of the trades under notice "goes without saying." Labor has also had to give up here and there slight percentages of the wages conceded in more prosperous times, but in a general way capital has lost more than labor, even though the artisans have in many instances been restricted to four or five days' work a week. Workmen in Great Britain, taking them as a whole, are believed to have been better employed and better off than the majority of their class in any other country. Foreign competition has made no particular progress during the year, and has developed no really new phases. Here and there the forced sales of certain articles have made them selves felt rather severely, but we have gained almost as much as we have lost, and may regain the whole provided we look after it properly and insist upon equitable treatment at the hands of steamship owners and the railway companies. In restricting production sundry experiments have been tried at home and abroad. In some cases—such as the rail and tin plate trades—the results are reported to have been decidedly satisfactory, while in others the formal arrangements have been either nullified by bad faith or have been openly broken as occasion seemed to suit. Having thus generally glanced over the year's business, I may touch upon the leading details of each quarter, albeit, as has been mentioned already, everything has been at such a dead level that there is very little variety to place on record.

First Quarter.

The month of January opened quietly, the only satisfactory feature in the crude-iron markets being the estimated reduction in Scotch stocks (which stood at about 500,000 in Connal's stores and 241,000 in makers' hands, a total of 821,000 tons) of 14,000 tons during the year. On the other hand, hematite-pig stocks had increased by 50,000 tons, and stood on the West Coast alone at 250,000 tons. Cleveland stocks had increased by about 37,000 tons (to 204,000 tons) in December; so that in these three districts only there were about 1,282,000 tons of pig iron on hand at the beginning of the year. Scotch warrants stood at 42/4; Middlesboro', No. 3, at 35/ @ 35/6, and mixed numbers of West Coast hematites at 44/ @ 44/6 1/2 ton. The quarterly meetings of January were mostly quiet. At Middlesboro' on January 6 the meeting failed to impart any animation to business, which was restricted throughout and confined mostly to small purchases from the merchants, who quoted lower prices, because of the increase of stocks. The market was weaker, No. 3 being with merchants about 35/4 on the average for early delivery. Forged pig was about 34/ and warrants were about 35/6. The prices of manufactured iron showed no change. Bars were £5 2/6; angle iron, £4. 12/6; ship plates, £4. 17/6 @ £5; sheets, £6. 15/; less 2 1/2%. At Wolverhampton on January 7 the ironmasters' meeting was well attended. The tone of the gathering was quiet. Finished-iron manufacturers spoke of it as being then too early to speculate with any degree of certainty upon the probable demand. Sheet-makers generally gave the best reports as regards the extent of the sales. Competition was severe, and rates

Second Quarter.

The advent of April brought no change of moment. Scotch warrants were about 41/11, Middlesboro' No. 3 foundry was 34/1, and mixed numbers of hematite pigs about 44/1/2 ton. At the quarterly meetings there was no great amount of business done. At Middlesboro' on April 7 there was next to no business transacted, owing to the holidays. The foundries were taking out but little iron. Ship plates were £4. 15/; ship angles, £4. 10/; and common bars, £4. 7/6, all less 2 1/2%. At Wolverhampton on April 8 the meeting could scarcely have fallen at a more inopportune date, since, being Easter week, most of the works were closed. Business was any-



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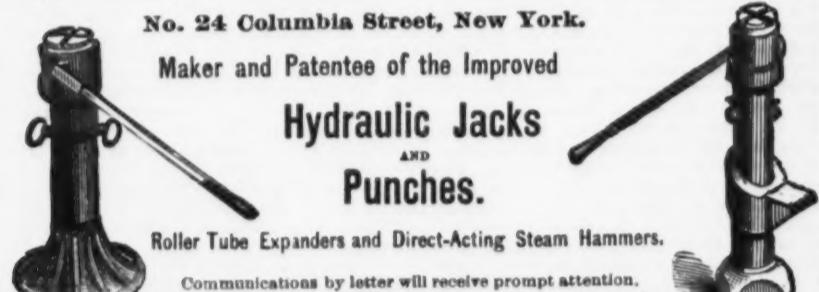
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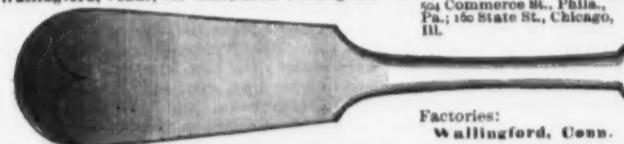
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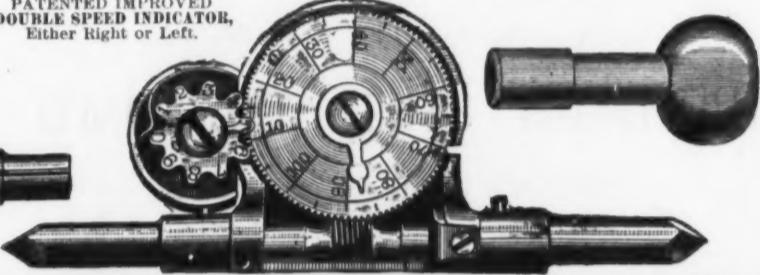
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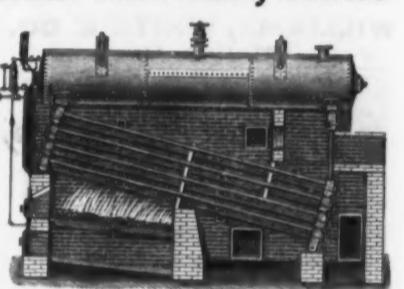
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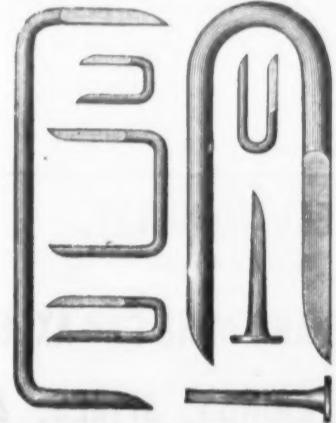
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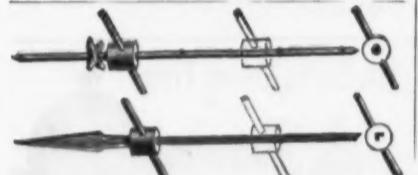
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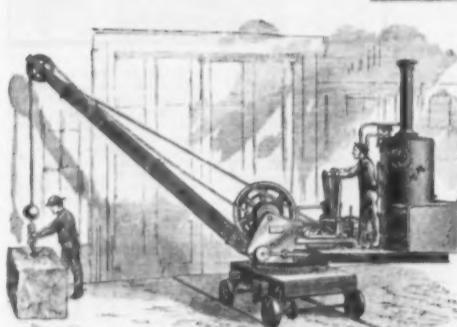
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thing but brisk. Makers of all-mine pigs, headed by the Lilleshall Co., redeclared the earlier quotations of 80/- for cold-blast pigs and 60/- for hot-blast. Such figures, however, were only nominal, and sales, if effected, had to be on the basis of 55/- @ 57/- for hot-blast pigs. Second class Staffordshire pigs were an average of 40/- @ 42/-, and cinder pigs 34/- @ 36/- in actual business. Alfred Hickman & Co. quoted hydrates £2. 12/6; mine iron, £2. 5/-, and common, £1. 17/6. Mr. David Kenrick quoted 40/-, and other Staffordshire makers were in proportion. Competition was keen, and buyers naturally enough made the most of it. Prices were easy all round. Derbyshires were named as 41/- @ 42/-, delivered to works, but some lots changed hands at 40/-. Northamptons were 38/- @ 39/-; North Staffordshire pigs were quoted 42/-, but the full price could not be realized. The manufactured-iron trade lacked animation, and the orders given out were of small extent. Sheets sold better than any other description, but even in this branch the demand was by no means flourishing. Marked bars (Earl Dudley's) were redeclared at £8. 2/6, and £7. 10/- for the other "list" firms. But at 10/- @ 20/- less 1/2 ton excellent branded bars were to be had in abundance by merchants doing an Australian and other colonial business. Second-class bars were £6, and common £5. 10 down to £5. 5/- Good hoops were £6. 5/-, and common £5. 10/- £6. 5/- @ £6. 10/- were named for merchant singles. Galvanizing doubles were £7 @ £7. 5/- and lattens £8 @ £8. 5/-. E. T. Wright & Sons refused to quote less than £7 for singles, £7. 10/- for doubles, and £8. 10/- for lattens. Their boiler plates were £8 1/2 ton and upward for the Wright quality, and £8. 10/- and upward for the Monmoor brand. Galvanized corrugated sheet makers did not give a brisk account of the demand nor of the prices ruling. The Wolverhampton Corrugated Iron Co. named 11/10, Liverpool, as their quotation for 24 B. C. bundles. At Birmingham on April 9 the meeting was largely attended. Nominal prices were the same as those just given. Some of the largest producers of marked iron made no secret of their conviction that the interests of the trade would be better served by a closer approximation between nominal and actual prices, but they were overruled by one or two old, conservative firms, who are interested in iron mainly as a factor in upholding the prices of and royalties upon coal. Common bars were in abundance at £5. 10/- and even less, some large transactions being reported at £5. 5/- while common sheets ranged from £6. 10/- upward for singles, £7 for doubles, and £7. 15/- for lattens. Marked sheets are £9. 10/- but those of J. Bagnall & Son, Limited, were quoted £9. High-class sheets of the Severn brand are £12 and Wilden £13. Since the break up of the drought in the Australias good orders were coming to hand for Netherton bars and BBH and other favorite brands of sheets, but there was a great scarcity of American orders, and in other respects the shipping trade in iron was at a very low ebb. The customary quarterly meeting of the galvanized-iron trade was held in private, but no change was made in prices. The quarterly meeting of the tin plate trade was held at Swansea on April 2, when Mr. Flower presided and about 34 works were represented. There was a great deal of discussion on several points. A committee had been appointed at the last meeting at Birmingham to consider the question of the cause of black spots on tin plates, and how to provide a remedy. In reply to Alderman E. R. Daniel, it was said that that committee had not yet reported. A suggestion was then made that the committee should consider the question of offering a premium for some method of obviating these spots. It was understood that the committee would fix upon the amount of the premium and report to the next quarterly meeting. On the question of price it was agreed that it should stand at 14/- 1/2 box, and that sellers should ask more, and not less. On the subject of the restriction of make there were two propositions. The first was to stop all the works for one week in every quarter. This was discussed, but not decided upon. The second proposition was to stop the works for one week at Whitsuntide, and this seemed to meet with much favor. Ultimately it was agreed that the permanent committee should be asked to draw up a scheme for restriction of make and report to a special meeting. By the end of the month some values had further declined, but in other lines, such as steel angles and sheets, more work was reported to be in hand. Probably a better state of things would have come about had it not been for the continued political complications. May came in quietly, and the iron markets were irregular, owing to the political excitement of the time being, and the general fear that war would take place with Russia. Values of almost all kinds were rather low in consequence, but in many of the branches of the iron and steel trades a good deal of work was in hand on Government account. The Scottish mild-steel works were also so well engaged that they again advanced angles 5/4 1/2 ton, and tank-plates 2/6 1/2 ton. By the middle of the month there was less political tension, owing to the impression that the Afghan difficulty had been settled, and a somewhat better feeling was tentatively evident, owing to the relaxation of freights. The Whitsuntide holidays were very fully observed, and the month came to an end without there having been the improvement which not uncommonly takes place during May. June opened no better than its predecessor—in fact, the complaints of dullness seemed to be emphasized, and the universal keenness of competition certainly assisted in pushing down selling values to even lower levels than had been reached previously. This was demonstrated by the official return of the sworn accountant to the Northern Board of Arbitration, showing that the average net selling price per ton was 1/2 ton lower than in the previous two months. In the iron market there appeared to be "no bottom," and the nominal quotations afforded no safe criterion of the actual values. The demand remained dull and languid, and many of the concerns had some difficulty in keeping their men and plant in operation even for five days a week. The unfavorable

nature of the Board of Trade returns for May added to the depressed tone, and brought Scotch warrants back to 41 1/2, and Cleveland No. 3 to 32/-, while hematite pigs were about 43 1/2 ton for mixed lots. With the resignation of the Government there came further political complications which in no way assisted trade, even if they did no particular harm. The first half of the year, therefore, closed with as much languor and scarcity of new businesses as had been noticeable any time during the preceding six months.

THIRD QUARTER.

The second half of 1885 and the month of July began with a new Ministry just in office, and with a somewhat more settled state of affairs abroad, but commercial matters generally did not amend, and the iron trade in particular was not any stronger. Scotch warrants stood at 40/10, Middleboro' No. 3 at 32/- and hematite at 43 1/2 ton. Reserve stocks were everywhere heavy and growing, and the only departments which showed more activity were the tin-plate and black-sheet mills. Just prior to the quarterly meetings several failures happened in the Midland iron trade, and the outlook was not improved thereby. In respect of the quarterly meetings the accounts were not very cheerful. At Middleboro' on July 5 there was scarcely any business done. The manufactured-iron trade was very sluggish, and the demand kept down to a very low point. There were no indications of improvement, as the reports regarding shipbuilding were less favorable, especially as to iron plates and angles. Steel for shipbuilding was in good request, but the rail trade was quiet, taken as a whole. Steel rails were £4. 15/-; manufactured-iron bars, £4. 15/-; angles, £4. 10/-; ship-plates, £4. 15/-, less 2 1/2%; puddled bars, £3, net. Foundry work was not very plentiful. At Wolverhampton, July 6, the meeting was well attended. There did not appear to be much desire to enter into forward contracts of much magnitude either by sellers or consumers. The Lilleshall Iron Co., Shropshire, determined to make no alteration in their quotation for all-mine pigs, and redeclared cold-blast sorts at 80/- 1/2 ton and hot-blast sorts at 60/-. This lead was followed by the Staffordshire makers, one or two of whom, indeed, asked as much as 62/6 for hot-blast all-mines. Purchasers mostly declined to advance upon 55/- or 57/6. Staffordshire part-miners were varied in price. They might be said to range from 40/- to 45/-, although in a few cases 37/6 was named. Cinder pig was 35/- up to 36/6. The Spring Vale make was quoted at: Hydrates, 52/6; mine, 45/3, and common, 37/6. More business was done in Derbyshire and Northamptons, and other similar classes of iron, than in native makes, and agents reported that during the preceding fortnight or three weeks considerable sales had been effected. Derbyshire pigs were 40/- 1/2 ton, easy, and Northamptons 38/-. Firms making finished iron who have not a considerable merchant connection were doing the least, except in cases where galvanizers were specially catered for. Orders for sheets from these last buyers were arriving in moderate numbers. Marked bars were redeclared at £7. 10/-, a quotation which had prevailed for some two and one-half years, while Earl Dudley's bars were £8. 2/6. It was generally conceded that W. Barrows & Sons and the New British Iron Co. were almost the only people who were standing out for the £7. 10/- price, and that the majority of the high-class bar firms were selling at £7, with £6. 10/- as the quotation for their second-class qualities. Medium qualities were £6 and common £5. 5/- @ £5. 10/-. Common hoops were £5. 10/- @ £5. 15/-, and superior qualities 10/- additional. Gas-tube strip was £5 @ £5. 5/- and upward. Rates for sheets were irregular. Hard doubles changed hands at £6. 15 @ £7, and lattens at £7. 10/-. Good boiler plates were quoted £8 @ £8. 10/-, and tank plates at £7 upward. At Birmingham on July 7 the meeting was numerously attended, but it was scarcely an improvement upon its predecessor in point of business. The market was disturbed and depressed by adverse reports and apprehensions affecting the stability of different firms, and before the close of the day it transpired that two iron-making firms and two merchant houses were under the necessity of facing their creditors. The attendance of London and Liverpool buyers was below the average. There was very little business offering for shipment, and, as manufacturers generally refused to make further concessions, the few indents were withheld. For local consumption a fair number of small transactions in bars, sheets and pig iron took place, and some good transactions in cheap Welsh bars were reported. Sheet-makers bought pig iron in lots of 500 and 1000 tons, chiefly hematite and Derbyshire, but the prices were not allowed to transpire. The quarterly meeting of the galvanized-iron trade was held in private, and no report was made of the proceedings. It was understood, however, that the makers present generally acknowledged the possession of considerable orders, but at prices which left them only the barest margin of profit. The tin-plate makers had just completed their arrangements to stop production one week out of every four, which had the effect of strengthening values, and, generally, of ameliorating the prospects of the industry. The hot weather of the month interfered with the output in some cases, but its broader influence upon trade was decidedly beneficial, inasmuch as the continued heat materially improved harvest prospects. The commencement of August brought nothing new except the usual holiday season and vague reports here and there of a little more steadiness in some branches of the iron and steel trades. That steadiness did not imply an augmentation of the demand, but rather a slowly growing impression that prices had seen their lowest and must surely amend. The tentative, hopeful tone probably received some encouragement from the harvest operations, which were commenced and carried out in many parts of the country under very favorable conditions. About this juncture it was officially stated that the make of pig iron during the first half of the year had decreased by 184,125 tons, while stocks had increased by 243,386 tons, or approaching 500,000 tons lessened turnover—a statement

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Pat. July, 1873.

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The properties of these Wheels are such that they can be used with great advantage and economy for cutting, grinding and finishing Wrought and Cast Iron, Chilled Iron, Hardened Steel, Slate, Marble, Glass, &c. These Wheels are extensively used by manufacturers of Hardware, Cutlery, Edge Tools, Saw-blades, Safes, Stoves, Fire Arms, Wagon Springs, Axles, Skates, Agricultural Implements and small Machinery of almost every description.

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Pat. Jan. 26, 1869.

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This practical and indispensable article—especially for wear where exposed to ice, snow, or slush—was first introduced by this company several years ago, and its real value is in being almost indestructible when properly made and used. It is manufactured, whilst the cheap, inferior quality forced on the public by reckless imitators of our patent goods soon becomes brittle and crumbles to pieces. Address

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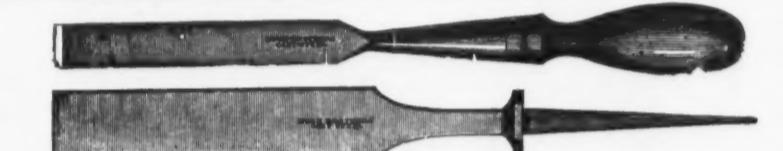
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which had no very good effects upon the market. Toward the close of the month, nevertheless, a rather better tone prevailed, mostly owing to the better reports received from the United States. When September commenced, therefore, this tone was inclined to take the form of optimism, and it was rumored that numerous inquiries had been received from American buyers for pig iron. The sheet-iron rollers raised their prices by 2/6 $\frac{1}{2}$ ton, and the galvanized-sheet producers by 5/ $\frac{1}{2}$ ton, both being said to be busier than for some time previous. Then the newspapers began to write about the improvement in the iron trade, and it might have been supposed that we had started an uproarious boom at the shortest possible notice. The speculators at once saw the possibilities of the situation, and began dabbling in warrants, which advanced by 1/ @ 1/6 $\frac{1}{2}$ ton, and caused crude iron generally to be more firmly held. On September 8, indeed, Glasgow warrants touched 43/10—a rapid rise as compared with 41/8 on September 1. Men of experience in the trade failed to observe any really valid reasons for the change, but they could not and did not object to benefit by it, which some of them did to the extent of 1/ or 2/ $\frac{1}{2}$ ton above the recent selling rates. This was the case even in some kinds of finished iron, the greater firmness of which doubtless had something to do with the augmented demand for various sorts of hardware. A process of filling up, indeed, began, and in several departments attained welcome proportions, although there was never the remotest possible approach to a boom. As the month closed American advices continued cheerful, and values showed symptoms of a steadiness which augured well for the future.

Fourth Quarter.

The advent of October was characterized by a generally quiet but steady tone, with a considerable amount of business in hand, and great watchfulness on all sides for any symptom of a further amelioration of the demand or values. Under these circumstances more than ordinary interest attached to the quarterly meetings of the ironmasters, merchants, &c. At Middlesbrough on October 6 there was not only no increase of business, but the trade seemed to be worse. The makers who were well sold quoted high rates, the merchants quoted 32/4 $\frac{1}{2}$ for No. 3, and 1/ less for No. 4 for early delivery. The leading finished-iron departments—plates, bars and angles—were very quiet indeed, and prices were not maintained. Manufacturers asked for ship angles, £4. 12/6 @ £4. 15/; ship-plates, £4. 12/6 @ £4. 15/; sheets, £6 @ £6. 5/ less 2 $\frac{1}{2}$ %. Puddled bars were £3, net. At Wolverhampton on October 7 the meeting was rather better than that of July. The improvement was apparent in sheets more than any other articles, but the pig vendors likewise spoke of revived purchases. The Lilleshall Iron Co., Shropshire, declared no alteration in their quotations, which were nominal, at 60/ for hot-blast pigs, and 80/ for cold-blast. The bulk of the actual business done was at 55/ @ 57/6 for hot-blast, and proportionate figures for cold-blast. Staffordshire all-mine makers quoted at 55/ up to 60/ for hot-blast, and 75/ up to 80/ for cold-blast, but without much business. Staffordshire part-mines were 37/6 @ 45/ and cinder pigs mostly 32/6 @ 35/. The spring Vale Co. quoted 52/6 for hydrates, 42/6 @ 45/ for mine and 35/ for common. Derbyshire and similar class pigs were an average of 39/ @ 40/ $\frac{1}{2}$ ton delivered, though some vendors quoted 41/6. Northamptons were priced at 38/ @ 39/. Marked bars were re-declared at £8. 2/6 $\frac{1}{2}$ ton for Earl Dudley's make, and £7. 10/ for those of the other few leading houses. It was fully understood, however, that, except in the case of about three firms, export orders were being filled at £7 $\frac{1}{2}$ ton, and these firms offered a second-quality bar at £6. 10/ down to £6. Common bars, too, were slow of sale at £5. 10/ down to £5. 5/ as a minimum. Common hoppers were £5. 10/ and superior £6 @ £7. 5/ $\frac{1}{2}$ ton for hard doubles, which was an advance of between 5/ and 7/6 $\frac{1}{2}$ ton upon the quarter, and £8. 2/6 @ £8. 5/ for lattens. Singles were an average of 15/ @ £6. 17/6. At Birmingham on October 8 there was a decidedly better tone all around than at the midsummer meeting. On this occasion the market, though not active, was steady, and prices of sheets, bar and tin plates ruled higher than at the previous meeting. Pig iron was the same as at Wolverhampton the day before. At the private meeting of the galvanized-sheet trade the makers present reported a good demand, and in several cases stated that they were obtaining 7/6 @ 10/ advance upon the prices ruling the previous quarter. A proposal to declare a fresh minimum advance of 5/ was withdrawn. Specifications for several hundred tons of sheets, chiefly for Australia, were placed with different Staffordshire makers, but in every instance the full advance was enforced. Makers of black sheets, though less united than the galvanizers, were sharing in the general improvement, and prices in this department were 2/6 @ 3/6 higher than at midsummer. Some of the angle-makers were busy, for local consumers chiefly, in common with the safe and bedstead branches, but in most other departments the iron trade was reported very slack, and complaints of the competition of steel were general. Some sensation was caused by the importation of American charcoal pig iron into England, and various deductions were drawn therefrom, but the simple fact afterward appeared to be that the iron was of a special sort and imported for a special purpose—namely, the manufacture of malleable-iron castings. Some feeling was also excited by the placing of an order for steel sleepers in Belgium by the Midland Railway Co., but this occurrence was explained to be isolated, and the company have since given out orders for the sleepers to British Bessemer concerns. To ward the end of October the market became rather less hopeful, and values were more irregular, notwithstanding the fact that a considerable turnover was still being effected in different parts of the country. In the North of England the wages arbitration resulted in a drop of 2 $\frac{1}{2}$ % on mill and forge pay, and of 3d. $\frac{1}{2}$ ton on puddling. The in-

coming of November reminded the trade that the end of the year was rapidly approaching, and that great activity would be needed to "keep up the returns," especially in view of the general election. Iron and steel prices remained quiet and irregular on all sides, and the reserve stocks were steadily increasing in Scotland and elsewhere, concurrently with diminished shipments and an uneven home consumption. The greater part of the month was much disturbed by the electioneering whirlwind, which was decidedly detrimental to business. Toward the end of November, however, and, despite the elections, certain values grew better, and the reports from the United States showed that the market there was undergoing a favorable development, accompanied by inquiries in this country from buyers there for prices and supplies of Scotch and hematite pig iron, spiegel and steel rails. In the early part of December these American inquiries assumed the more practical shape of orders for moderate lots of Scotch pig, somewhat large parcels of hematite pigs, and a lot of 10,000 tons of steel rails. The last-named transaction, however, was an exceptional one, and not a fair criterion of the general demand, inasmuch as the rails were to be made of hammered blooms. Nevertheless, these transactions tended to support the market, and values became steadier in almost all kinds of crude iron, while the steel works were also better employed, owing to the giving out of large orders for sleepers. The rail mills also had more work. Since then, and especially since the termination of the appeal to the electors, matters have been quiet, but fairly steady. They will probably remain so up to the end of the year, with much caution in concluding forward contracts, under the impression that a forward movement is not at all unlikely to set in early in the new year. In the result, therefore, the present twelvemonth is ending rather more favorably than it began, in point of the tone of the market. It has not been a prosperous year by any means, but if it should be succeeded by even a moderate improvement its lessons will not have been learned in vain.

Welding Iron and Steel.

A series of experiments were undertaken by Prof. J. Bauschinger at the instance of an engineering firm. Similar experiments had been previously made at the Royal Mechanical Technical Experimental Institute, at Berlin, and by Mr. W. Hupfeld, at Prevali, which gave very different results, those at Berlin being very unfavorable, those at Prevali very favorable, as regards the welding capacity of steel. Professor Bauschinger recapitulates the main results of these tests before describing those made by himself. The materials used in the latter were steel, from the Peine Iron Works, at Hanover, and bar iron of various sections from the Neuhoffnungshütte, near Herkau, in Nassau. The test pieces were flat, square and round in section, the largest being 3.140 by 1.131 inches. Each piece was cut in two cold, swelled up on the anvil, when hot, 0.196 to 0.392 inch, and, after heating to the proper degree, the two portions were laid on each other and welded together by hand or steam hammer. Some preliminary studies were made in the laboratory of the college to ascertain the best method of welding and the best flux for steel; quartz sand answered the latter purpose, while it was found that a rather less degree of heat was required for steel than for wrought iron; a pure coal fire was used.

In the chief experiments the steam hammer was employed. Every piece after welding was tested in the usual way for tensile strength, the limit of elasticity, contraction, extension and ultimate strength being determined, the same quantities having been measured for pieces of exactly similar quality, section and length, but without a weld.

Both for steel and iron the limit of elasticity is nearly always reduced by welding, and this is, without exception, the case as regards the extension; the contraction of welded is less than that of unwelded pieces when the fracture takes place in the welded portion. The



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** BRONZE MEDALS at CHICAGO EXPOSITION. **

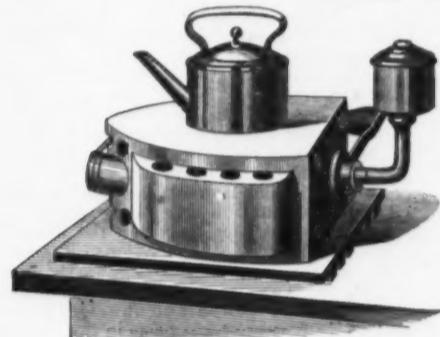
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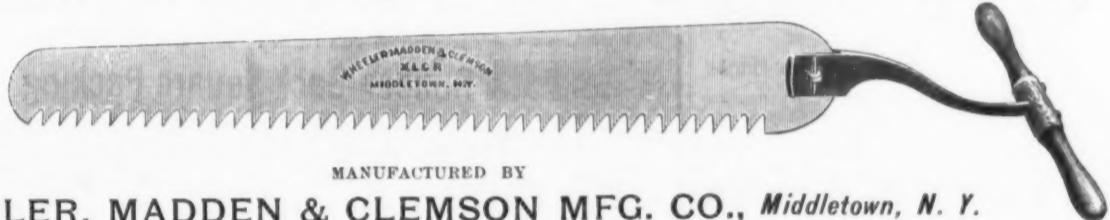


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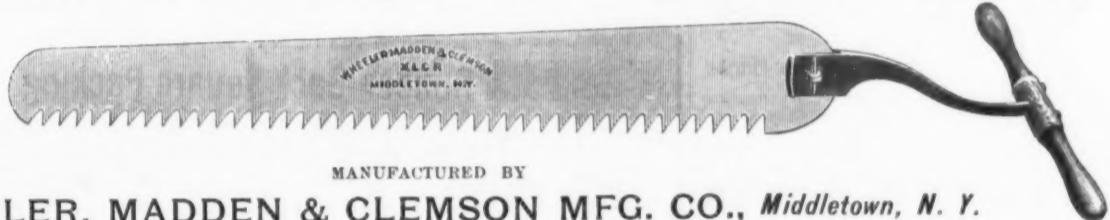
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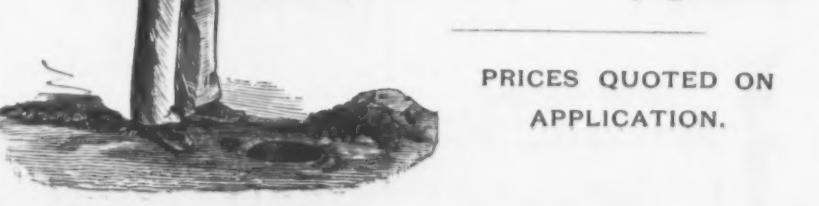
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is pressed from **one solid sheet of heavy steel**, and is the strongest and most durable Road Scraper made. Used in making railroad embankments, excavating for canals, ditching, &c. The largest contractors in the United States have used them exclusively for years.



RAILROAD OR CANAL BARROW.

With Jacobs' Patent Wood Wheel. Bent Tray, full sized, planed and well finished.



RAILROAD OR CANAL BARROW.

Same as above, except with Jacobs' Patent Steel Spoke Wheel.



ORE OR MORTAR BARROW.

With Jacobs' Patent Wood Wheel. All hardwood. Bowl dovetailed together and firmly nailed.



OPEN BOTTOM BRICK BARROW.

With Jacobs' Patent Wood Wheel. Folds for shipping same as Garden or Farm Barrow.



TIGHT BOTTOM BRICK BARROW.

Same as above except having Closed Bottom. We furnish either style of these Barrows with **Steel Spoke Wheel** when specially ordered.



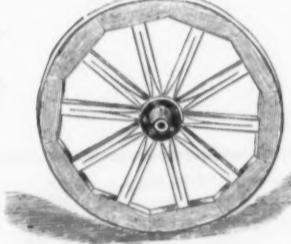
WOOD OR BARK BARROW.

Wheel same as above. Body and Dash strapped with heavy iron. Well finished. For Wood, Bark, Bales, Boxes, &c.

THE "COLUMBUS" SOLID STEEL ROAD SCRAPER.

JACOBS' PATENT WHEELS.

The Strongest and Lightest Running Wheel known.



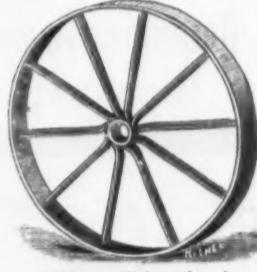
It will not shrink in any Climate. The Tire Cannot Come Off.

It has **TEN** spokes of thoroughly seasoned wood, and each spoke is supplied with a separate felloe. The hub is of chill cast iron, and riveted firmly to the spokes, which are so cut as to counterbrace each other. The spokes are keyed from the center after the tire is shrunk on. **This wheel will not shrink or give in any weather or climate, and the tire cannot become loosened.** An oil hole is drilled into the hollow washer of the hub, and the oil distributes itself along the bearings while the wheel is in motion. The wheel revolves on a fixed shaft or axle, which passes through the end of the handle, and is a brace to the barrow. This wheel cannot be broken or weakened by ordinary usage, and will last a lifetime. It is well painted. **We guarantee it superior to any other WOOD WHEEL.**

JACOBS' PATENT STEEL SPOKE WHEELS.



Wrought-Iron Tire
Steel Spokes.



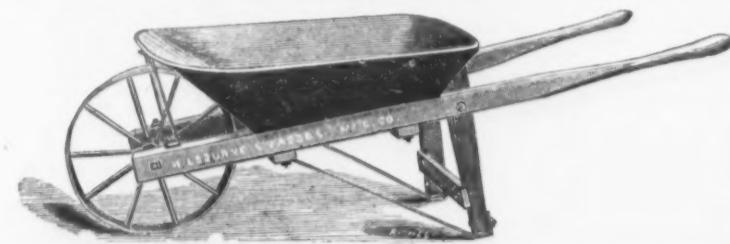
Without Hub—Showing Construction.

These wheels are so constructed—having spokes tightened from center—that the tire cannot come off or the spokes become loosened. Hubs hardened on inside. Oil hole in hub. Diameter of wheel, 17 inches. Wrought-iron tire, 1½ inches wide. **Steel** spokes.

The Best Barrow Wheel Manufactured.



The above cut shows the manner in which our **Railroad, Ore, Wharf and Steel Tray Barrows** are packed for shipment. This insures lowest rate of freight, and they can be quickly and easily set up by following the simple instructions sent with each half-dozen Barrows. In this shape Barrows require much less room for storage, and can be as easily set up as if received with Tray fastened to Frame.

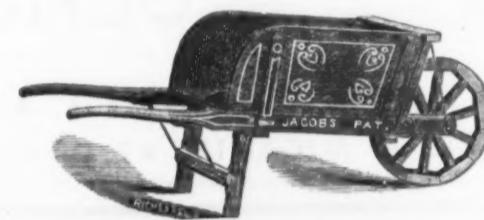


"COLUMBUS" STEEL TRAY WHEELBARROWS.

The Tray is stamped from **one solid plate of steel**. Steel Spoke Wheels 17 inches in diameter. Wrought-Iron Tire, 1½ inches wide. These Barrows, while much **lighter** than those having iron frames, are **equally strong** for all practical purposes, and will stand the roughest usage. Two sizes. No. 1, capacity 3½ cubic feet, for Earth, Sand, Ore and Foundry use. No. 2, capacity 5 cubic feet, for Coal, Manure, Sawdust, Ashes, &c. Pack for shipment same as R. R. Barrow.

We make three sizes of these Scrapers. No. 1, capacity, 7 cubic feet of earth. No. 2, 5 cubic feet of earth. No. 3, 3½ cubic feet of earth. Furnished with or without **solid steel shoes or runners**, as desired.

The bails are of refined iron, with strong and perfect working swivels. Bowls nest and handles crate compactly for shipment.



GARDEN OR FARM BARROW.

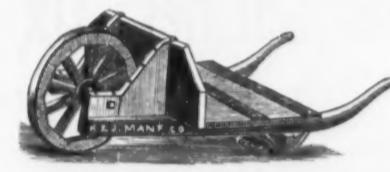
Set Up.

Double Frames and so constructed that by simply removing one bolt (the axle) and two nuts they can be folded flat down (see cut) and shipped at lowest rate of freight. Three sizes.



STRAIGHT HANDLE STONE BARROW.

With Jacobs' Patent Wheel. Strong, well-made, iron strapped over bottom and bolted together. For stone or pig iron, &c.



BENT HANDLE STONE BARROW.

With Jacobs' Patent Wheel. 17½-inch tire. Well ironed and bolted. Extra strong.



STEEL BOTTOM STONE BARROW.

Bottom and Dash formed of **one plate of steel one-fourth of an inch thick**. Steel Spoke Wheel. The strongest and best Stone Barrow manufactured. Very durable.



THE AUTOMATIC REVOLVING ROAD SCRAPER.

Three sizes. 30, 33 and 36 inch. Both Steel and Wooden Bottom.

electric main into the charging sockets of the battery, and to leave it there from the time the lamp is handed in at the end of a shift until it is wanted again, 12 or 14 hours after. Hundreds of lamps can be charged at a time in this way, and at very small cost. An engine developing an effective 5-horse-power, and a dynamo electric machine correspondingly small, would suffice to charge 300 lamps at one operation.

The Distribution and Proportions of American Blast Furnaces.*

BY JOHN BIRKINBINE, PHILADELPHIA, PA.

(Concluded from page 7, December 24, 1885.)

The following tables will indicate the number, the variations in size and what might be considered an average size for the furnaces using the different fuels in most of the States and in the whole country. The census statistics for the Iron and Steel Association for 1880 exhibit, by a series of maps, the location of iron manufactures and production, and give at a glance the general position and the relative importance as to the amount of output of various sections of the country. Taking the blast furnaces, I find that in most cases convenience of supplies, ore, flux and fuel or the carrying of their product have been the guiding causes in determining the location, and, generally speaking, the existence of iron ores in the immediate vicinity has predominated in selecting the location of the blast furnaces, particularly those of the older plants, but in many cases the works have been placed far from their ore supplies, and more convenient to fuel or market.

In the former class, viz., those located close to ore supplies and distant from sources of fuel, may be mentioned, practically, all of the blast furnaces using mineral fuel in the New England States and in New York. The furnaces at Pittsburgh and in Western Pennsylvania generally have cheap fuel convenient; some have a partial supply of local ores, but most of them obtain their ore supply from distant points. In Eastern Pennsylvania, Southwest Virginia, Colorado, Tennessee and Alabama fuel and ores both abound, and the furnaces may be classed as occupying middle ground as to transportation facilities.

The furnaces about the larger cities of New York, Pennsylvania, Ohio, Illinois and Missouri have mainly the convenience of market and competitive transportation of stock for a basis of location. Some of them possess certain advantages as to reception of raw materials, but their position must be considered as available chiefly on account of the market and railroad features. In general terms we might say that heretofore the furnaces located for a market for their product have been less successful than those placed nearer ores or nearer fuel; but some new plants, situated at good market centers, to which ores, fuel and flux must be carried long distances, appear to produce most satisfactory results.

The charcoal furnaces of the United States are mostly placed close to or within cheap transportation of ore supplies, and the accessibility of sufficient fuel is also considered in selecting a site. Some of the charcoal furnaces, such as those in Michigan, Wisconsin and Washington Territory, have to transport their ores to locations where fuel is abundant, but, with few exceptions, the location of the charcoal furnaces may be considered as being placed close to their ore and fuel supplies, practically independent of market conveniences, and often of transportation facilities. The charcoal furnaces about Baltimore are favored with cheap fuel, on account of having water transportation from extensive areas of timber. They are convenient to market, but suffer on account of costly ores. As a rule we have not been as careful as circumstances warrant in selecting locations for blast furnaces, and our iron-producing industry probably suffers fully as much from bad location as it does from inferior construction or from want of good management. There are a few active blast furnaces which have been apparently injudiciously located, for which an excuse can be found in their connection with some other business enterprise, such as the development of a large tract of land owned by the parties operating the furnace; but generally the plants which are defective in location are idle, and those in blast now are favored either by excellent management, modern equipment or superior location.

The annexed table, compiled from the Directory of the American Iron and Steel Association, has been prepared to illustrate the range, dimensions and capacities of furnaces in various parts of the country using the different fuels. The table is arranged, first, in the order of the kind of fuel used, three classes only being recognized, namely, those using anthracite coal, or anthracite mixed with coke; those using bituminous fuel, embracing furnaces depending upon coke, raw bituminous coal, or raw coal mixed with coke; and furnaces which are operated by charcoal. The table represents the maximum and minimum diameters of bosh and the maximum and minimum height of furnaces at the time it was prepared. In connection with the maxima and minima, average dimensions are presented, not as being absolute, but merely as indicating in a general way the preponderance of size. The maximum height and maximum diameter, or minimum height and minimum diameter, are not necessarily associated with one furnace, but the calculation has been made as also one to show the average capacity, merely with the view of illustrating at a glance the general proportions of the furnaces in each district or State.

Total number of stacks in the United States:

Anthracite	221
Coke and bituminous	221
Charcoal	234

Total

that the Directory and report are not contemporaneous by a few months.

Aggregate annual capacity of same:

Anthracite	9,074,082
Coke and bituminous	5,067,100
Charcoal	1,380,000

Total

9,471,182

Maximum height of furnaces, 86 feet; minimum height of furnaces, 17 feet. Maximum bosh diameter of furnaces, 21 feet; minimum bosh diameter of furnaces, 6 feet. Average capacity of all furnaces in the United States, 14,011 net tons annually.

The difference between the capacities and the output of our blast furnaces is often misunderstood by those who discuss iron

many charcoal furnaces still pursue of blowing out early in each year when the stock of charcoal is exhausted. As in most parts of the country where charcoal pig iron is produced charcoal cannot be made in meilers before May, a large proportion of the furnaces are idle when the April returns are collected. To more fully understand the proportion of active and idle furnaces, the accompanying table has been prepared, showing the percentage of the blast furnaces of the United States, arranged according to the fuel used, which were active at the dates named. The reports from the two authorities are placed in parallel columns, and wherever the data have been approximately contemporaneous they are on the

show 68.1 per cent. of the charcoal furnaces in operation, and those for April, 1877, except but 20.2 per cent. in blast.

This analysis may surprise some, for few will surmise that in the past 12 years there have at no time been two-thirds of all the blast furnaces in the country in operation;

cause many reported out of blast are handicapped by situation, size, equipment or supplies, and go out of blast at times when more fortunate plants can operate successfully. There are, however, always a considerable number of blast furnaces being repaired or rebuilt; scaffolds, fires, chills, explosions,

PROPORTIONS OF AMERICAN BLAST FURNACES USING COKE OR BITUMINOUS COAL AS FUEL.

States and districts.	Number of stacks.	Reported annual capacity, Net tons.	Dimensions of furnaces.												Average capacity per furnace, Net tons.	
			Height.						Diameter at bosh.							
			Maxi- mum.	Min- imum.	Aver- age.	Maxi- mum.	Min- imum.	Aver- age.	Maxi- mum.	Min- imum.	Aver- age.	Maxi- mum.	Min- imum.	Aver- age.		
Pennsylvania:																
Shenango Valley	27	567,000	78	0.46	0.59	1.20	0.9	0.13	9	21,000						
Allegheny Co.	16	713,500	85	0.45	0.70	8.20	0.12	0.17	6	41,600						
Miscellaneous	39	619,700	78	0.28	0.56	2.19	6.8	6.16	6	15,900						
Total for State	82	1,900,200	85	0.28	0.62	0.20	0.8	6.14	4	23,200						
New York:	1	18,000				0.65	0		13	0	1,800					
	1	8,000				50	0		11	0	8,000					
	12	226,000	85	0.35	0.59	9.20	0.9	0.13	8	18,800						
Virginia	10	211,000	75	0.50	0.63	4.18	0.10	6.14	8	21,100						
Alabama	1	30,000				63	0		16	0	30,000					
West Virginia	7	127,000	75	0.50	0.60	7.17	0.10	6.14	5	18,100						
Kentucky	3	57,000	68	0.62	0.65	0.16	0.15	6.15	10	19,000						
Tennessee	8	217,500	70	0.61	0.66	2.18	0.13	6.15	10	27,200						
Ohio:																
Hanging Rock Dis.	15	164,300	86	0.47	0.58	2.18	0.11	0.14	3	11,000						
Mahoning Valley	18	473,000	80	0.45	0.65	2.18	0.10	6.15	4	26,300						
Hocking Valley	14	209,100	64	0.44	0.55	1.16	0.12	0.14	3	15,000						
Miscellaneous	17	442,000	80	0.51	0.63	0.20	0.13	0.15	2	26,000						
Total for State	64	1,288,400	86	0.44	0.60	9.20	0.10	6.14	9	20,100						
Indiana:	2	18,000	60	0.52	0	1.13	0.12	0		9,000						
	16	667,000	75	0.60	0.69	3.21	0.14	6.18	0	41,700						
Missouri	8	168,000	75	0.56	0.60	6.20	0.14	0.15	8	21,000						
Michigan	2	30,000	63	0.60	0	1.17	0.12	0		15,000						
Wisconsin	3	77,000	66	0.55	0.62	4.17	0.15	0.16	4	25,700						
Colorado	1	24,000		0	65	0			15	0	24,000					
Total	221	5,067,100	86	0.28	0.66	0.21	0.8	6.14	11	22,900						

PROPORTIONS OF AMERICAN BLAST FURNACES USING ANTHRACITE COAL AS FUEL.

States and districts.	No. of stacks.	Reported annual capacity, Net tons.	Dimensions of furnaces.												Average capacity per furnace, Net tons.	
			Height.						Diameter at bosh.							
			Maxi- mum.	Min- imum.	Aver- age.	Maxi- mum.	Min- imum.	Aver- age.	Maxi- mum.	Min- imum.	Aver- age.	Maxi- mum.	Min- imum.	Aver- age.		
Massachusetts	1	10,000		50	0		14	0	10,000							
New York	40	556,150	71	0.40	0.56	6.18	0.12	0.15	0	13,900						
New Jersey	20	281,200	80	0.20	0.54	9.20	6.7									

A. F. PIKE MFG. CO.,

PIKE STATION, GRAFTON CO., N. H., U. S. A.,
The World's Headquarters for all kinds of
SCYTHE STONES, OIL AND WATER STONES, RAZOR HONES, ETC.

SCYTHE STONES.



We have Scythe Stones from almost every reliable Quarry in the World.

OIL STONES.

Washita, Arkansas, Turkey, Hindostan, Orange, Chocolate, Scotch, Labrador and other Grits in every shape required.



The only Manufacturers of Pike's Genuine Indian Pond (Red End) Blue Stone.



Pike's Black Diamond.



Pike's Genuine Lamoille Blue Stone.



Pike's Genuine Ragg, 9 and 10 inch, and Genuine Ragg, No. 2.



Axe Bits from any kind of Grit and of any shape desired.



Genuine Imported Cigar Shape Emery.



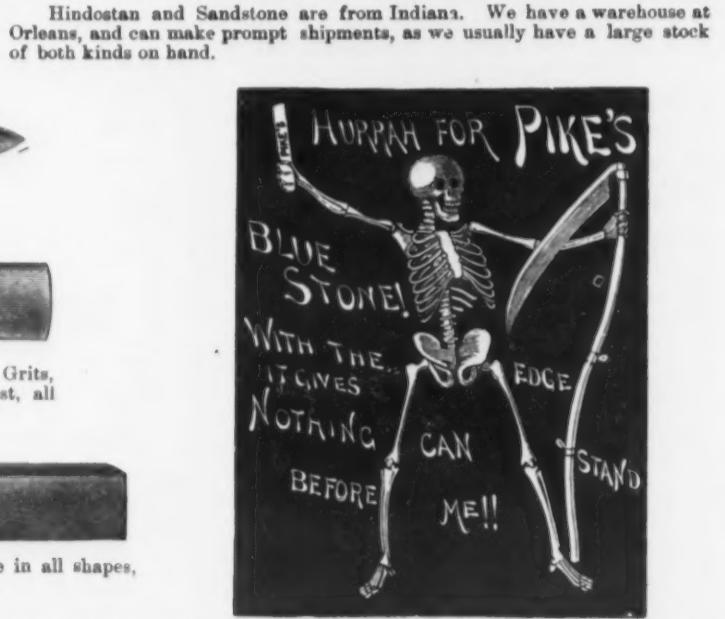
We make Hacker Stones from Hindostan, Vermont and other Grits, and can supply from the cheapest second quality to the choicest, all white, perfect stone.



The celebrated Chocolate Stone, from the Lisbon Quarries, made in all shapes, for Scythes, Carpenters' and Shoemakers' use.

PIKE'S HINDOSTAN OIL AND WATER STONE.

SAND STONE



We import large quantities of Belgian, Italian and German Razor Hones, and believe we can supply the Trade at lowest prices and satisfactory quality.



Pike's Green Mountain.



Darby Creek pattern of Genuine New Hampshire, Vermont, Ohio and Michigan Grit.



Pike's Mowing Machine Stone, No. 1 and No. 2.



Emery Table Hones; also an excellent Knife Sharpener, from choice Grit Stones, of about same shape as the Table Hone.



Genuine Sir Pyers Mostyn's Talacre, and Ohio Round English, 9 1/2 and 12 inch.



Pike's German Pattern of Genuine Indian Pond and Lamoille Grits.



Gritty and Diamond Pearl Scythe Stones are a fine, soft, free-cutting Grit, of a Pearlish-White color.

Agents: JOHN H. GRAHAM & CO., 113 CHAMBERS ST., NEW YORK, AND WM. PICKETT & CO., 164 LAKE ST., CHICAGO, ILL.

SEND FOR CATALOGUE AND PRICE LIST.

OIL STONES.

considered on the active list which consist of stone stacks lined with shale and sandstone, blown with cold blast through one open tuyere, the blast being supplied from wooden blowing-tubs connected with a water-wheel, their product averaging from 4 to 6 tons per day. Modern plants, making over 300 tons per day, with equipment of powerful steam blowing machinery, hot blast stoves, &c., furnish the other extreme, and between these two are the large majority of American blast furnaces. Fully 75 charcoal blast furnaces employ cold blast, and the number of furnaces which are operated with open tops exceeds 100. Although modern practice has been in favor of stacks formed of iron shells supported on columns, nearly one-half of the stacks herein enumerated are in whole or in part stone or brick structures, and one-fourth are what is known as "bank furnaces"—that is, they are placed against a hillside, so as to receive the stock at or near tunnel-head level. The remodeling of old plants and additions to equipment have caused many furnaces to occupy debatable ground as to character of structure, but without considering the details of arrangement the above summary will be found close to the facts as they exist at this date. Reconstructions or new plants will continue to decrease the proportion of older arrangements, but many will continue, by reason of local surroundings, to be ranked as named.

MECHANICAL.

A Unique Locomotive Feed-Water Heater.

A unique locomotive feed-water heater, devised some years ago by Mr. Henry Schlacks, superintendent of motive-power of the Illinois Central Railroad, is thus described in the *National Car-Builder*: Attempting to utilize for steam-making a portion of the heat that passes through the smoke-box and smoke-stack of the locomotive, Mr. Schlacks made a stack with a lining that provided a hollow chamber to hold water, and the upper portion of smoke-box was also made with a water chamber that was in communication with the stack chamber. The cold water was pumped into the stack chamber, and thence was conveyed by proper means to the boiler. The thing worked all right for a few weeks, and effected considerable saving of heat, for the feed-water was raised to about the boiling point before it passed into the boiler. One day, when the engine was in the house, Mr. Schlacks was looking at the heater, when he saw a drop of reddish water leak from under the smoke-stack base, and run down the smoke-box. On examining closely, he observed that the drop cut a tiny furrow on the iron it ran over, and he decided that a probable bad cause of corrosion was present; so that day he had the delivery pipes from the pump and injector so arranged that water could be put into the boiler direct. He also made provision for shutting off communication between the heater and the boiler by stop-cocks. The precautions were not taken any too soon, for on the next trip the heater developed a bad leak. Mr. Schlacks collected some of the powder left by the corrosive agent, and took it to a chemist for analysis. This gentleman interested himself in the case and made some investigations. He concluded that the comparatively cold surface of the heater acted as a condenser on the steam and sulphurous gases passing from the fire, and that a reaction took place, producing small quantities of sulphuric acid, which attacked the iron plates. On figuring up the cost of construction and maintenance of heaters made in this way, and the saving to be derived from their use, Mr. Schlacks concluded the invention would not pay, so it was abandoned.

Hodgson's Eccentric Mandrel for Locomotive Eccentrics.

We show in the two annexed cuts what is known as Hodgson's mandrel for quickly and cheaply turning up locomotive eccentrics and other eccentric work of a similar kind. It consists of a face-plate, A, bolted directly to the face-plate of the lathe, an expanding mandrel working in a slide, and a center, D₂, sliding in a direction opposite to that in which the mandrel is moved. This center takes a bearing on the dead center of the lathe. Fig. 1 shows the mandrel in position, with eccentric E ready for

This block is held in place by the nut B₂. When the nut B₁ on the screw B is slackened up, the mandrel C₂ can be moved to and from the center by putting the handle A₁ on the screw A₄. A scale is marked off on A₂, the divisions being half-inches instead of inches, so that the throw of the eccentric is laid off from the drawing directly, without the liability to mistakes. The mandrel carries four wedges, C₁, which work in grooves with inclined bottoms. These wedges are all dovetailed into the ring C₂. As this ring is run in or out, the wedges, of course, are moved in and out correspondingly. The block B₂, working on the screw B, controls their motion. The block D is put on the

New York, is the agent, received the medal of superiority at the last American Institute Exhibition. This elevator has several important improvements, and differs from all others in that it has a double-acting automatic brake by which the load is always held at any desired point either in raising or lowering, loading or unloading. The load may be lowered at any speed, the brake coming into action whenever the operator pulls on the check-rope or lets go of it. It is therefore a safe elevator, and at the same time one of the most rapid hand elevators at present in use. It is put in position with the greatest ease by any carpenter or millwright.

the respective values of a pound of coal and a pound of the liquid fuel as evaporators of water. A man-of-war can carry only a limited weight of fuel, so that a comparative test of the weight of the two fuels is the most practicable that could be applied. So far the system, we understand, has proved superior to others previously tried.

Gasoline Gas and the Otto Gas Engine.

Probably many who have erected or contemplated the erection of a small power plant for which a gas engine seemed specially applicable have encountered difficulties in the matter of gas supply and have perhaps made unsuccessful attempts to press gasoline gas into service. To such the following from a correspondent of the *English Mechanic* will prove interesting: "I send you an account of an Otto gas engine which has been worked for three years with gasoline gas, at a cost of about £6 per year. Some three years since I bought a 1-horse Otto gas engine. I also purchased of Mr. F. W. Clark, of London, one of his patent gasoline gas apparatus, on condition that it would not drive the engine it was to be returned.

"The engine did not at first work quite satisfactorily, but I felt convinced that it could be made to do so. I concluded to keep the gas apparatus, and I then began to experiment with the engine, and for upward of two years it has worked to my entire satisfaction. In summer time I can light the gas apparatus and have the engine running in 10 minutes, and in one minute can stop engine and gas apparatus, leaving both perfectly safe till again required. In winter time, in very cold weather, more time is required to get the apparatus hot—about 20 minutes. The secret is this: Heat your cylinders and your gas and you will have no further trouble. I have two copper boxes (through which the gas passes to cylinder and slide lights) fixed on the top of the retort, and the waste heat from making the gas is sufficient for this purpose. I also heat the water in the jacket of cylinder to about 100° by having a Fletcher's gas bath-heating apparatus between cold-water supply tank and cylinder, so that I can shut off the cold water when necessary. If any of your readers will do the same they will have no difficulty in working the Otto gas engine with gasoline gas."

A New Drill Press.

Messrs. E. E. Garvin & Co., 143 Centre street, New York, are making something new in the drill press line, which we here illustrate. The four spindles driven with gearing have each an independent automatic feed and adjustable trip. They are counterbalanced by levers shown at the top of the machine, so that when the feed-pinion is out of clutch the spindle can be raised or lowered by the direct movement of the handle fastened to the shell which forms the lever

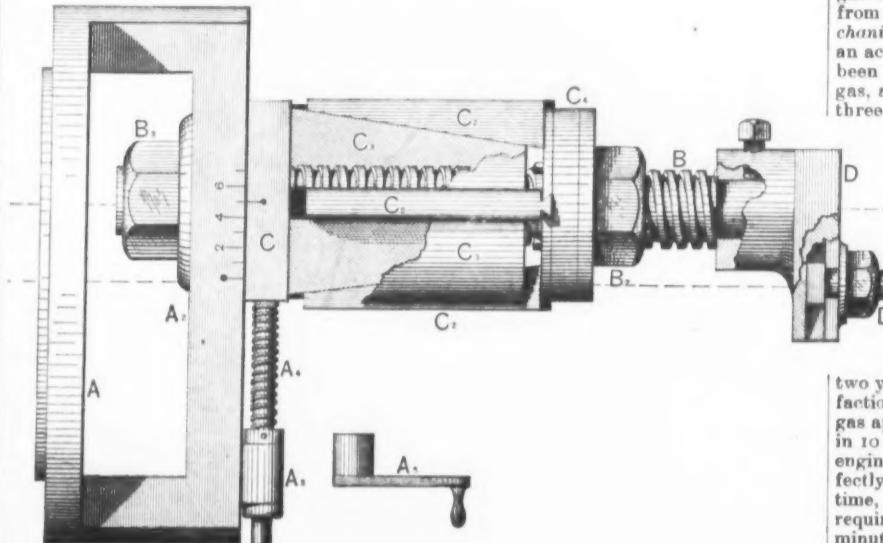
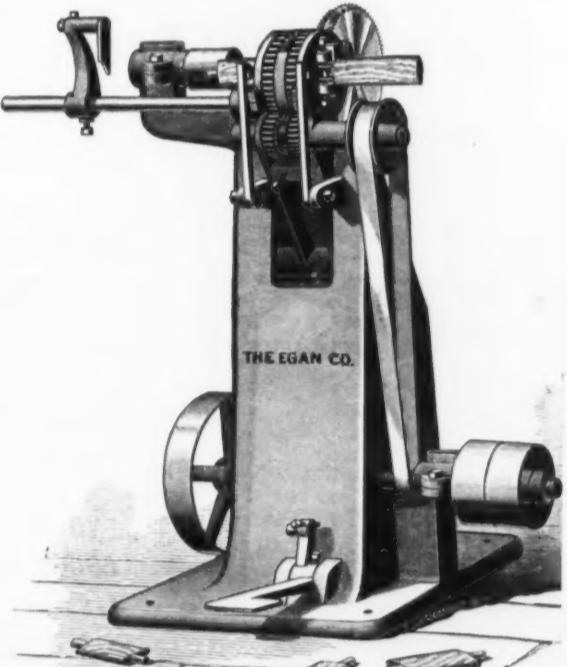


Fig. 2.—Details of Construction.

head of the screw to carry the sliding center D₂, and thus support the mandrel at the outer end. The center is formed on an ordinary 1-headed screw with a cup end. This block comes off when a piece of work is to be put in place. The whole rig is not only simple, but has been found exceedingly convenient, and has been used for a long time. The Baltimore and Ohio Railroad use the

Blind-Slat Tenoner.

Many new points of advantage are claimed by the Egan Company, of Cincinnati, Ohio, for their new blind-slat tenoner, a general view of which is presented in the annexed cut. The frame of this machine is a pedestal well designed and cored out, making it stiff and durable. The frame is cut on one side so that no dust nor chips are



Blind-Slat Tenoner, Manufactured by the Egan Company, Cincinnati.

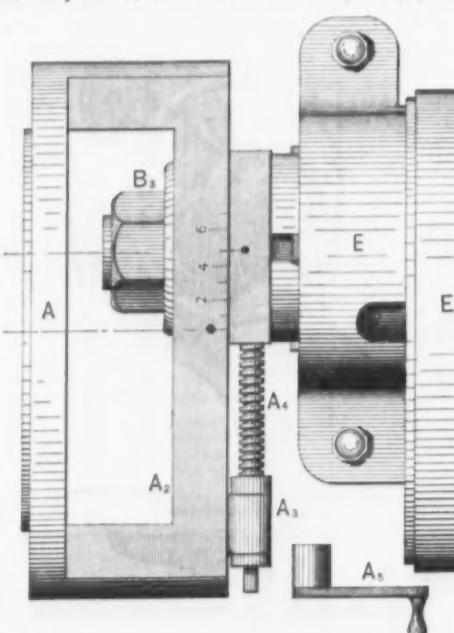
mandrels in the shops all along their line, and speak of them in very flattering terms. The device saves time, being capable, it is claimed, of doing twice as much work as can be done on the old plan; it saves the cost and trouble of the many eccentric mandrels required in every railroad shop, and the work is done more accurately than by any other method. The tool, more

liable to lodge in it. Jaws are so arranged as to be instantly adjusted on both sides by one screw having a right and left hand thread. By this means speed and accuracy are combined, and the manufacturers claim that the jaws can be set much quicker and much more accurately than by any other method in use. The treadle is convenient to the operator, and slightly pressing with the foot brings the head with its slat forward. One revolution is made when a stop is struck. A complete blind slat with tenon on two ends is made by a single revolution. In length a slat can be cut on this machine from 1 inch up, as required. The gauge will admit of any length, and the stops can be instantly changed so as to gauge accurately wherever required.

A special feature to which the makers direct attention in this machine is that when the treadle is released from the foot the feed-belt is loose, and when the foot is on the treadle the feed belt is tight. The makers recommend this tool for use in planing mills, car shops and in all other places where good and rapid work is required. They claim that with it a boy can do work more rapidly and more accurately than an expert on machines ordinarily employed.

Liquid Fuel in the British Navy.

Experiments with liquid fuel still receive a good deal of attention abroad. A trial is now being made at Portsmouth, England, with the object of determining the practicability of applying it in connection with the boilers of men-of-war. Several systems have already been tried, but the difficulties which presented themselves in the shape of smoke and irregularities of combustion were found fatal objections. The present system under trial is one submitted by Colonel Sadler, of Middleboro', and is understood to have been previously tested with satisfactory results by private companies in Portsmouth and elsewhere. The fuel consists of creosote, which is procurable at a cost of about 2 cents a gallon. It is contained in a tank, and is kept at a uniform temperature and consistency by steam coils inside the tank, from which it is forced into the furnace by means of steam injectors. The present experiment is confined to comparing



Hodgson's Mandrel for Turning Locomotive Eccentrics—Fig. 1.—Mandrel in Position with Eccentric E Ready for Turning.

turning. The mandrel is set by the gauge on the bar A₅, and, as shown in cut, is ready to turn an eccentric with a throw of 5 inches.

Fig. 2 shows the details of the construction. The bar A₅ has a slot in which the block C and the mandrel C₂ slide in and out.

over, will last for years without repairs. It is made by the L. B. Flanders Machine Works, of Philadelphia, Pa.

Hoisting Machinery.

The Harrington Hand Elevator, for which Mr. J. Q. Maynard, of 12 Cortlandt street,

other. There is no switching at the ends of the road, as the track is laid in circle, and the cars can make the curve and continue on the return trip without stopping. The slack of the secondary cable is taken up and its tension adjusted by means of tension rollers under the car. This system will require only a shallow subway below the surface of the track, as the secondary cable—the small one that imparts the motion to the car—comes up through the slot as the car passes, and drops back below the surface. With this system the car can be run on single or double track and can make the curves and switches as readily as a horse car.

Recent Improvements in Gas Engines.

The recent London International Exhibitions disclosed the fact that many minds have been engaged in the work of improving the gas engine, and Patent Office records show that within the past two or three years there has been quite a host of applicants for patents in connection with gas engines. The *English Mechanic*, in a recent issue, referring to English patents in this field, says:

Many of the applications refer only to modifications in details of well-known types, but others are radical departures from accepted practice. For instance, as agent for a foreign inventor, Mr. L. A. Groth patents improvements in gas or oil motors which consist in forcing a mixture of air and gas, by the motion of the working piston, quickly into a hot chamber until the mixture is ignited by the combined action of the compression and the heat of the walls of the chamber. The expansion resulting from the explosion—or, rather, sudden combustion—of the mixture being the driving power. The regulation of the ignition at the precise moment of the dead point is effected by a valve which admits more or less combustible matter, and by another which regulates the heat of the cylinder. Mr. P. M. Justice patents, as the agent of a foreign inventor, an automatic gas motor in which the igniter is rendered incandescent and explodes the mixture as soon as the velocity of the incoming gas is diminished. After the explosion a vacuum is formed which draws in a fresh charge of gas and air, and the parts having returned to their former positions, the charge is again ignited. Among the more novel and most recently completed devices is a compound gas engine, patented by H. P. Holt and F. W. Crossley, of Manchester, in which the passages for charging, igniting and exhausting are governed by the movements of what is called the high-pressure piston, without requiring the complication of a separate slide. It would be impossible to explain the arrangement of this engine without diagrams, and we must therefore refer those interested to Specification 15,311, 1884, for details. It must suffice to say that the invention appears to be an ingenious attempt to adapt the compound principle to gas engines by allowing the expanding gases in the smaller or high pressure cylinder to exhaust into the large or low-pressure cylinder, which process of exhaust induces the flow of fresh supply of gas and air into the high-pressure cylinder.

Another novelty, patented by A. Davy, Sheffield, consists in the use of a steam generator in combination with a gas engine in order to effect economy by utilizing part of the heat of explosion in the gas chamber to convert water into steam. The explosion chamber is surrounded by the steam generator or water chamber, and a portion of the products of combustion are also exhausted into the generator and intimately mixed with the steam formed therein. The mixture of steam and products of combustion thus obtained is used for working the piston on its return stroke or for driving a piston of larger area in another cylinder—thus producing in two senses a compound engine. Another patent which seems to have some promise of success is that of E. J. C. Welch and R. C. Rapier, which refers to an engine of the type in which the gas is burned quietly and continuously under pressure, and the hot products are from time to time passed into the working cylinder, where they impart motion to the piston. The suction and delivery valves of the gas and air pumps are so constructed that when upon their seats the pump pistons can approach them so closely that clearance is reduced to a minimum, while in order to vary the amount of air and gas delivered by the pumps the suction or the delivery valves are caused to remain open for a certain proportion of the stroke of the pump piston when in the ordinary course of things they would be closed, or a direct communication may be made between the two ends of the pump, which is kept open during a variable part of the early portion of each stroke. The gas and air are delivered separately into the furnace of the combustion chamber. The burners consist of a tube closed at one end and open at the other, suitable openings being made in the closed end for the passage of the gas into the tube, and narrow slits or rows of holes are made lengthwise of the tube for the admission of air. The closed or gas-entrance end of the tube is fitted closely into a hole leading into the gas chambers, while the body of the burner extends through the air chamber and out into the combustion chamber, it being made air-tight where it passes out through the air chamber. When at work the gas enters through the end of the burner and mixes with more and more air as it passes along through the perforated tube until a point is reached at which it can commence to burn, and where carbonic oxide is first formed by the initial combustion. As more air becomes mixed with the carbonic oxide it is converted by further combustion into carbonic acid. In order to regulate and maintain a continuous combustion a quantity of broken pieces of fire-clay or other refractory material is placed above the burners. To reduce the temperature of the products of combustion they are mixed after combustion with an excess of air or a proportionate quantity of water, which is converted into steam. In starting the engine, gas is turned on from the main, and air is admitted through openings in the bottom of the furnace, so as to heat the broken fire-clay and coils containing the water to be injected. The air and gas supplies and the

Buffalo + Forge + Company,

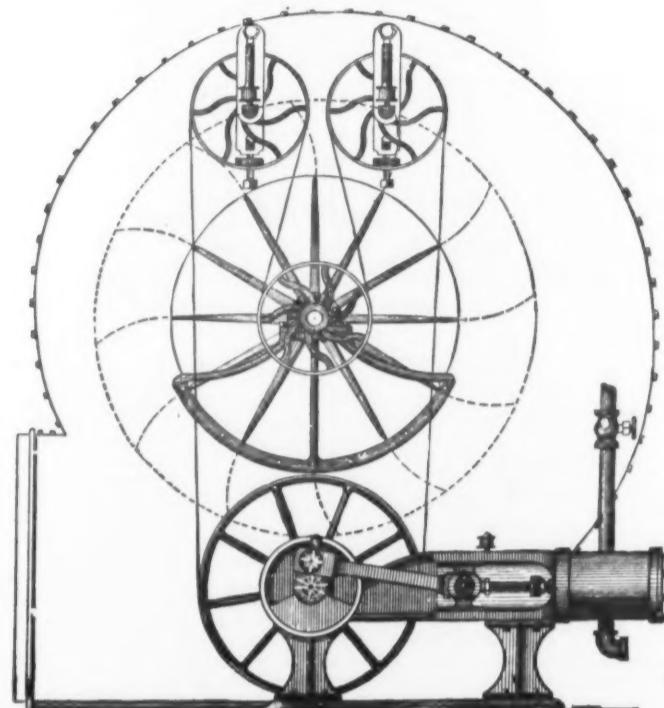
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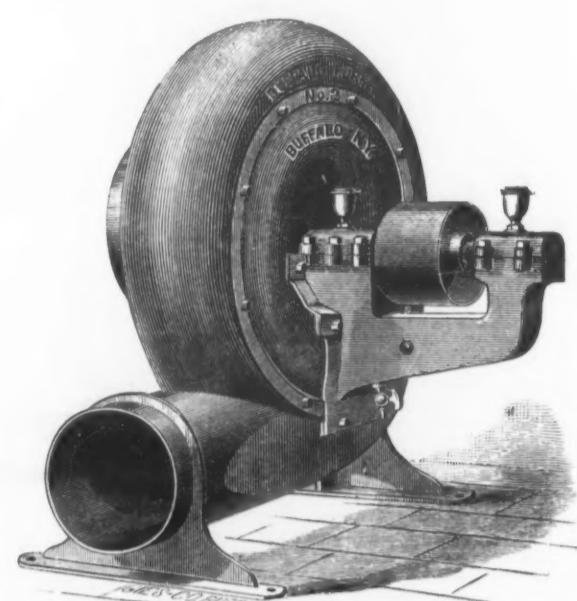
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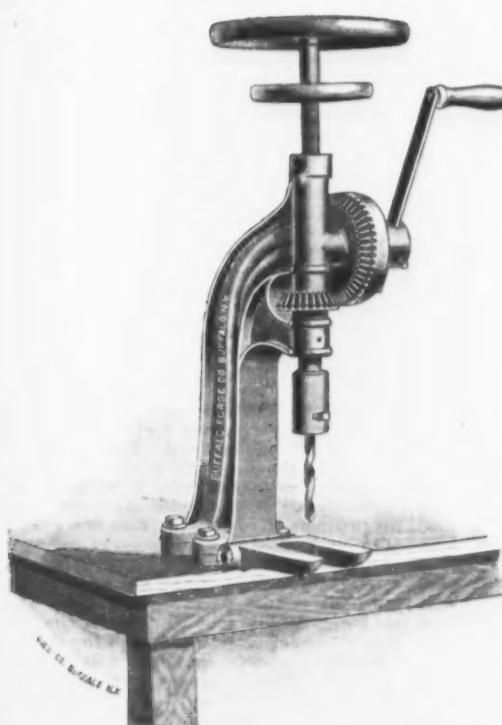
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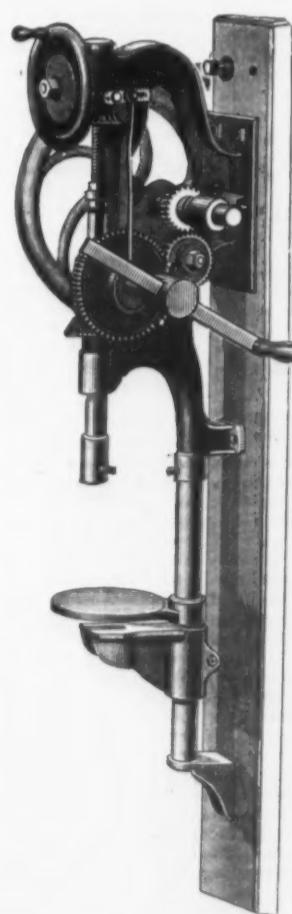


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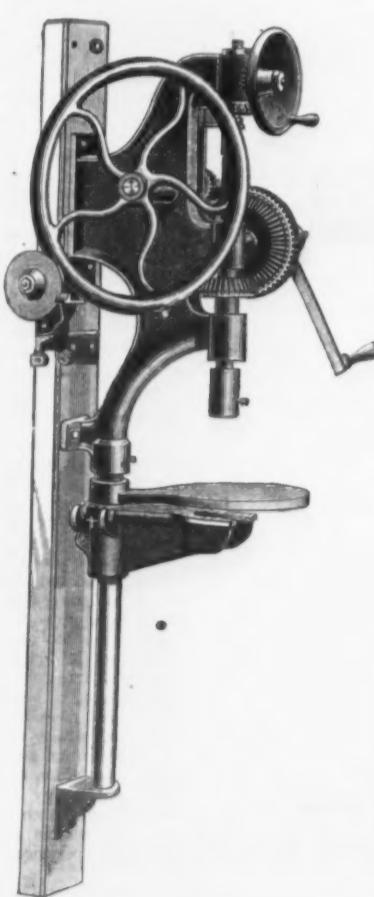
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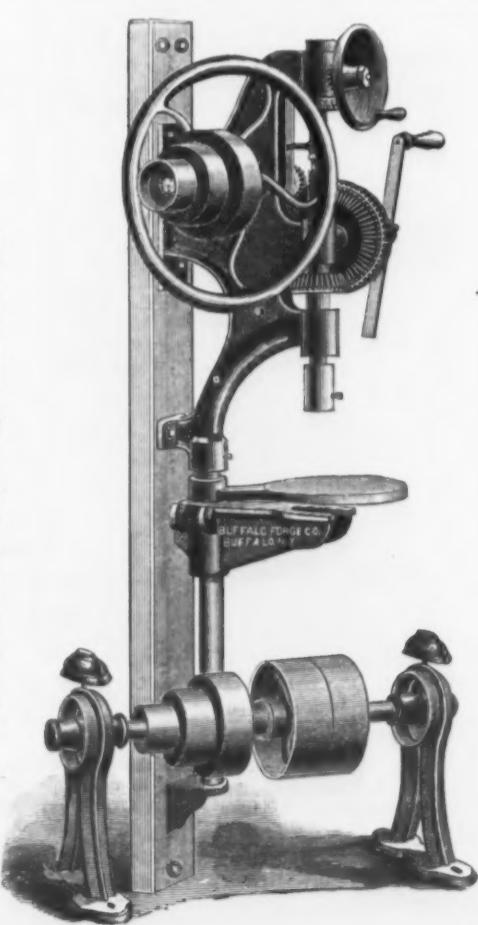


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outlet from the furnace are then closed, and, water being admitted to the coil by turning the engine a few times or by a hand pump, sufficient pressure is generated in the combustion chamber to work the engine.

W. J. Hill, of York, patents a method of cooling the working cylinder by circulating air in passages around it, which air is subsequently used for admixture with the gas to produce the explosive mixture. E. Capitaine and O. Brunler, of Berlin, patent a novel form of engine which may rotate on a fixed crank-shaft, the crank being in a casing and the explosive mixture being conveyed to the cylinders through the hollow shaft. T. Parker, of Wolverhampton, patents a device in which there are three cylinders having pistons connected to the same crosshead. One is a working cylinder having a space beyond the stroke of the piston, forming a combustion chamber, into which the other pistons force air and gas from their respective cylinders. G. C. Douglas patents an improvement which consists in introducing air into the motor cylinder while combustion is taking place for the purpose of utilizing the latent heat of the dissociated gas to increase the efficiency of the engine. By adjusting the volume of air pumped into the working cylinder it is claimed that there is no necessity for cooling the cylinder with water and wasting useful heat. Any device which will prevent the enormous loss of heat, which is the greatest defect of gas engines, is a decided step in advance, and it is in that direction that real improvement is to be looked for. We have thus jotted down a few notes of devices which may or may not be improvements, but for each one that we have mentioned there are at least a dozen the novelty in which consists in modifications of the mechanical details. In this connection complication of valve gear seems to be step in the wrong direction, while the device patented separately by H. P. Holt, in which the passages for charging, igniting and exhausting are governed by the movements of the piston without requiring a separate slide or moving valve, is an example of the kind of improvement which will probably be found most successful.

Hail-Washing Device.

Concerning the frequently-mentioned hot-water apparatus for washing rails, we find it stated that the device is now in successful use in the Hauenstein Tunnel, on the Swiss Central Railway. The tunnel is about $1\frac{1}{2}$ miles long and runs in a straight line, with a grade of 25.2 per 1000. The water issues at a high pressure. In the first instance a low pressure was tried, but the adhesion diminished instead of increasing, and high pressure was then adopted. A small ejector is placed upon the foot-plate; this is worked by steam from the boiler, which forces the water (drawn from the tender-tank) along a 1-inch pipe to the front of the engine. The pipe is then divided into two branches, which charge the water through orifices $\frac{1}{2}$ inch in diameter, at a temperature of 140° F., and a velocity of 92 feet per second, at points about $2\frac{1}{2}$ inches above the rails, a little in advance of the wheels. The consumption of water is stated to be about 11 gallons per minute. The rails are thoroughly cleansed, and the slipping of wheels, which was constantly occurring in this tunnel before the system was adopted, now very rarely takes place. Sand is seldom required, and the wear of the rails and tires is greatly diminished. The company have fitted the apparatus to all the six-wheel coupled tender engines, which work both the passenger and goods trains through the tunnel. The engines are still fitted with sand-boxes, sand being used in the open.

Lead, Expansion and Compression in Steam Engines.

There are three different ways in which the work stored in the piston, piston-rod and connecting-rod of an engine can be utilized during the latter half of the stroke. Firstly, we may cut off steam very early in the stroke, and so permit the latter half of the stroke to be completed by the momentum of the reciprocating parts; secondly, we may cushion by closing the exhaust early, in which case useful work is done, because the steam compressed does duty instead of fresh steam from the boiler, and, thirdly, we may give lead and admit steam from the boiler, in which case useful work is done on it by slightly superheating it; but this is really the most wasteful way in which the work can be taken out of the reciprocating members of a steam engine, while the most economical consists in a happy combination of an early cut-off, by which the gross effective pressure falls below the resistance during the last half of the stroke, with cushioning. It has been shown that cushioning is one of the best possible means of securing economy; but it must not be forgotten that it is by no means easy to design an engine which shall combine in itself the conditions necessary to the adoption of the most favorable point of cut-off and of compression at one and the same time. Indeed, it is not too much to say that the investigation of this problem has up to the present fairly baffled every mathematician who has tackled it. It would be easy enough to do what is wanted if steam were a perfect gas, but it is not. Under the circumstances far more rough-and-ready ways of attaining the end most wanted, namely, the production of a good diagram and the elimination of shocks, has compelled engineers to resort to lead, and this cannot possibly be dispensed with to advantage in quick-running engines. In these last, unless there is a full pressure of steam in the piston at the beginning of the stroke, the crank has literally, and not by any figure of speech, to drag the piston away from the end of the cylinder, with, of course, jar and thump on the crank-pin. It is, however, utterly impossible to lay down any hard-and-fast rule concerning the amount of lead that ought to be given. It will vary not only for every engine, but with the conditions of pressure, &c., under which each engine is working. Noisy engines can be made to run silently and silent engines can be made noisy by the lead. Broadly speaking, the more lead the better; but it must not be forgotten that cushioning can be made to do duty that lead cannot. Any one can make a steam engine, but it requires a very skillful engineer to combine to the best advantage lead, expansion and cushioning.

Wrecking and Artesian Well Pumps

A number of new specialties in pumping machinery have recently been placed on the market by the Knowles Steam Pump Works, of 93 Liberty street, New York. Among these we direct attention to what is known as the Knowles wrecking pump, shown in Fig. 1 of our annexed engravings. This special vertical design is a very convenient and inexpensive form of pump for wrecking, drainage or irrigating purposes. These pumps are largely used by the wrecking

ders ranging from 6 to 18 inches in diameter and water cylinders from 12 to 33 inches.

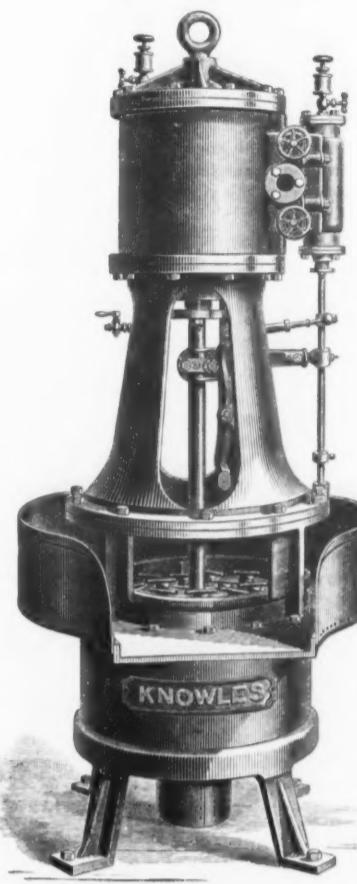
Figs. 2 and 3 show an improved form of Knowles' vertical pump, specially designed for non-flowing artesian wells and for driven pipe wells where the water fails to rise within drafting distance—say 25 feet—of the surface. It will pump from the deepest wells—2000 feet if desired—and deliver a steady stream of water or oil to any point. The engravings show the steam end as it appears in position at the mouth of the well, and the working barrel, or pump end, located at the bottom. This latter is a casting of the hardest composition—not soft brass tubing—and is carefully bored out and fitted with pump-bucket and foot-valve. It is screwed on the lower end of the well-piping through which the pump-rod works. The pump-rod connection between the pump-bucket and the upper plunger is made of wood or extra heavy iron pipe. The action of the pump is fully controlled by a perfected arrangement of steam-valves, making the up and down strokes equally uniform and regular. The pump-bucket discharges water on the up stroke, and the upper plunger discharges on the down stroke; consequently, the flow of water is steady and continuous. The pump-bucket and foot-valve are of special construction, and can be readily drawn up through the well-piping for examination or repairs. The steam end is arranged to slide to one side upon the bed-plate, which feature is very convenient when it is necessary to pull out the pump-rods or take up the well-piping. The pumps are made with seven different sizes of steam cylinders—4 to 16 inches diameter—and with 100 feet of piston travel the capacity varies from 30 to 288 gallons per minute.

English Letter.

(From Our Regular Correspondent.)
LONDON, DECEMBER 21, 1885.

THE END OF 1885

is now a proximate event, and as I write there is the usual bustle indicative of the approach of the Christmas holidays, which will begin on December 23 and extend more or less over the short balance of 1885. Business in many departments, especially in the lighter hardware branches and the fancy trades, is very brisk, but it is only a sort of dying splutter and will not in any way compensate for the depression of the year as a whole. Notwithstanding the long-continued dullness it is noticeable that there is a good deal of money in circulation, and it is argued that a large proportion of it is expended by the working classes. The upper and highest members of the body politic appear to be the most impecunious, and that circumstance is rightly taken to indicate that they have suffered and are still suffering most severely from the general depression of everything. As I have said on other occasions, indeed, labor has not felt the pinch of the hard times so seriously as capital. At the same time the turn of the workmen is coming. Reductions of wages are talked of on all sides, and in several branches of the iron trade notices have been given to the men with that end in view. In the Midland district the matter has been submitted to arbitration, while in the North of England the operative shipbuilders are actually stupid



New Pumping Machinery Built by the Knowles Steam Pump Works, New York.
Fig. 1.—Wrecking Pump.

companions of the seacoast and lake service; on the Lower Mississippi River they are used for draining bottom lands, &c. They are light, portable and have great pumping capacity. They are single-acting, and the flow of water from the pumps is practically constant, as the peculiar design and operation of pumps give this effect. They are claimed to handle large quantities of water with greater economy than centrifugal pumps, while they are much simpler and less likely to get out of order. They will not grind out and lose their suction power, causing excessive slippage, but, according to the builders, will fully discharge their correct theoretical capacity of water at any



Fig. 2.—Steam End of Artesian-Well Pump.

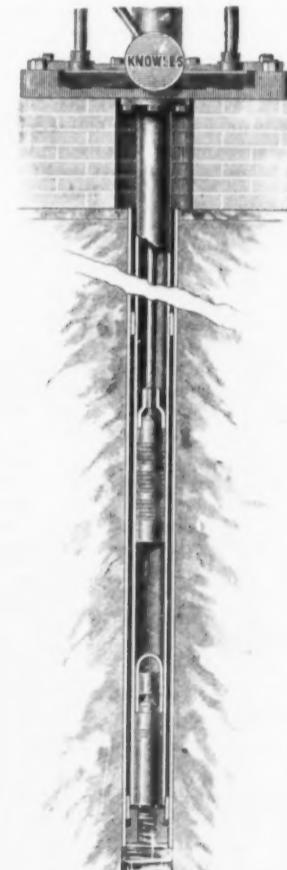


Fig. 3.—Working Barrel of Artesian-Well Pump.

speed—an impossibility with centrifugal and similar pumps. A full and comparatively long stroke, with an even, smooth motion on the up as well as on the down stroke, are special features of the Knowles pumps. The steam cylinder is positive and does not require any lever or other hand gear to work it "off the center." There are no belts to slip or complicated mechanism to get out of order. These pumps are simply lift pumps, and are not designed to elevate water above their discharge nozzles, but they will draw water any distance within the limit of suction power. The water cylinder is made of brass; the valve-seats, &c., are also of brass. The piston rods are brass-covered, so that these pumps are adapted for salt as well as fresh water. Valves of best vulcanized rubber are used, with the largest area possible to pass obstructions. The pump is made in five sizes, with steam cylin-

ders ranging from 6 to 18 inches in diameter and water cylinders from 12 to 33 inches.

overtime in as possible and to let each day stand alone in that respect. Hard experience has not yet taught the men much, nor has education largely expanded their views.

You will doubtless notice that in the *Times*, the *Ironmonger* and other leading British journals discussions are in progress on the fair-trade question. Fair trade finds many advocates, while numerous correspondents appear to be dissatisfied with free trade, while being still unsatisfied as to the claims of its rival. As I have said in these columns times without number, fair trade has gained a strong hold in many parts of this country and there are thousands of persons who are mild believers in it, but dare not avow their views. At the same time the free traders are staunch as ever, and I do not see how the fair traders can expect to make headway until they put before the public an intelligent and intelligible legislative programme. This they have not yet done, but I suppose something of the kind is in contemplation in view of the general election with which we are threatened next year, which struggle bids fair to be carried on two main platforms—Irish legislation and fair trade.

Considerable curiosity is being manifested as to the fate of the International Railmakers' Association. The leading spirit of the combination, Mr. George Wilson, of Sheffield, is dead, and it is not very clear upon whom his mantle has fallen. At all events it is surmised that the German makers mean to break away from the association unless they are allowed to share in the Indian and Australian orders. Under the existing rules these are reserved to the English mills as being for the "home market," but the Germans say they are not properly reserved, and say they ought to participate in the business. As a sign of the "rift within the lute," I may mention that the Victorian order for 40,000 tons of steel rails has been placed with Briscoe & Co., Australian merchants, London, at a price much below the official standard of the association. Messrs. Briscoe are not makers and will have to give the work out, and then get a profit on the transaction. It follows, therefore, that some of the rails may be made by the mills of the associated makers unless, indeed, the one concern in England not in the combination "takes the cake." Anyhow, there is a pretty good idea as to where the rails will be produced.

THE IRON MARKET

is again unaltered, and remains without special features to note. The near approach of the Christmas holidays and the end of the year is causing some little increase of activity at many of the works, but the open market is very quiet, and few new orders are likely to be placed until January. At Glasgow the market has been tolerably steady, and a moderate turnover has been effected in warrants, which closed at $42\frac{1}{4}\frac{1}{2}$ per ton. Scotch makers' brands are virtually unchanged. Shipments are pretty well sustained, but the reserve stocks are still increasing at a rapid rate—so rapidly, indeed, that the statistical statement to be issued by the end of the month will in all probability be of a very unfavorable character. At Middlesbrough No. 3 is easy at about $32\frac{1}{2}$ per ton for prompt and early deliveries. The business is only poor for local consumption, and the shipments are necessarily contracted at this season of the year. Nothing special has transpired as yet as to the continuance or augmentation of the restriction of the production. On the West Coast hematite pigs are steadily firm under the influence of a rather better home demand, coupled with American sales and inquiries for next year's deliveries. Mixed numbers in usual proportions are quoted at $45\frac{1}{2}$ per ton, f.o.b. West Coast ports or free on rail. Elsewhere pig iron is quiet, and for the most part obtainable on terms which are favorable to buyers. In heavy manufactured iron there is a good turnover at such of the establishments as are devoted to the production of bridge, engineering and structural-iron work, although existing contracts are being run through rather faster than they are being replaced. Fencing wire is still dull and weak. In galvanized sheets business is tolerably large, but values are extremely irregular, and the best markets are overstocked by lots sent out on consignment. Ordinary finished iron is about as of late, in respect of the demand and prices, both of which are irregular. Moderate lots of Welsh bars are going to India. The bulk of the consumption at home appears to be of common and lower medium sorts of bars. Sheets are fairly steady all round. Old materials are firm, but not quite changed. Freights are steady, but not much changed. Pig iron from Glasgow to New York by ordinary steamers being called $7\frac{1}{2}$ @ $10\frac{1}{2}$ per ton. The Australian freight "ring" is still the subject of much correspondence and dissatisfaction, especially in respect of the preferential rates alleged to be given by its members to goods from certain Continental ports. Steel is very quiet, and at many of the Sheffield works the usually busy period just prior to Christmas is this year one of the dullest ever known. The Bessemer concerns are doing tolerably well on rolled material, and the Siemens works continue pretty well engaged. Steel rails are in rather better request, but values are nominally unchanged, on the basis of £4. 15/2 D. H., and £4. 17/6 for flange sorts.

Summerlee,	"	51/4	45/
Calder,	"	51/	49/5
Carbrooke,	"	45/6	45/
Corde,	"	49/	42/
Monkland,	"	49/	40/0
Quarter,	"	42/6	40/
Govan, at Broomielaw,	"	43/	40/6
Shotts, at Leith	"	47/	46/6
Carson, at Grangemouth	"	51/	47/
Kimell, at Bo'ness	"	43/6	43/
Glengarnock, at Ardrossan	"	46/6	42/6
Eglinton,	"	43/	39/6
Dalmellington,	"	41/6	40/6

MIDDLESBROUGH PIG IRON

is dull and rather weaker, with only a poor business moving. Current figures for G. M. B., f.o.b. at makers' wharves in the Tees, net cash, less $2\frac{1}{2}$ %, are:

No. 1 Foundry	34/0	Mottled	30/9
" 2 "	33/9	White	30/3
" 3 "	32/3	Reddened metal	50/
" 4 "	31/9	Kentledge	37/6
" 4 Forge	31/3	Cinder	30/

WEST COAST HEMATITES

are steady at $41\frac{1}{2}$ @ 45/ for mixed lots in usual proportions. Stocks in the stores reach 98,883 tons, an increase of 34,940 tons to date this year. Shipments have been 407,053 tons, a comparative decrease of 82,443 tons. Steel-rail shipments from the West Coast ports have been 259,761 tons, a decrease of 6500 tons this year. Quotations are:

No. 1.	No. 2.	No. 2.
45/	45/3	45/
45/6	45/	44/6
45/6	45/	44/6
45/6	45/	44/6
45/	44/6	44/
45/6	45/	44/6
45/6	45/	44/6
45/6	45/	44/6
45/6	45/	44/6
45/6	45/	44/6
45/6	45/	44/6

Mr. Alexander Wilson succeeds his deceased brother George as manager of Chas. Cammell & Co., Limited, Sheffield, Workington, &c.

TIN PLATES.

In London during the week some of the makers have shown more disposition to meet the views of buyers as regards prices, but some of the works are still firm and refuse to accept orders for cokes below 14/6. The uncertainty as to the course certain firms will take next year in respect of the stoppage of operations one week out of every four is not operating very favorably on the market, and the future of values depends in a measure on the continuance of the combination among the makers. The stoppage of two well-known works this week is announced, and if arrangements are not made for resuming operations at an early date the fact must favorably affect the market. I quote ordinary IC cokes 14/ @ 14/6, f.o.b. Liverpool. At Liverpool buyers are holding off, the actual demand for America being almost nil, and, paradoxical as it may appear, there are many makers most anxious to sell at what may well be termed the most inopportune time, as the present most undoubtedly is. When good brands of coke tin plates are offered in abundance at 14/ IC, with but few, if any, buyers for the States, it cannot be far wrong in terming the present a "crisis" in the trade, especially when there is but little hope of an improvement or a turn in the tide taking place this year at any rate. The only reason to account for the trade having come to the present pass is that there is considerable doubt entertained in certain quarters as to the certainty of the combination to reduce the make being continued over next year, or even over the first half, as was intended. So long as there is any doubt existing on this subject there will not be much, if any, forward business done except at extremely low prices. It is a most unsatisfactory state of affairs altogether. The American demand is but of small account just now, and the greatest difficulty has been experienced in putting any business through at even unusually low figures. There have been some orders for coke tins placed at 14/ IC, but not many, and even that figure is 10/ obtainable now. The same may be said of Bessemer steel with coke finish at 14/3 IC, but they are all off now. Siemens steel plates with coke finish are but in poor request, and 15/ IC is not to be had but for exceptional lots, 14/9 IC being the figures now offering. Charcoal tins and turnes are also very quiet, with very few orders offering. There is a better demand for coke tins and Bessemer steels for the colonial and Continental markets, several orders having been placed.

THE HARDWARE TRADES.

The Iron Age

AND

Metallurgical Review.

New York, Thursday, January 7, 1886.

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The Nail Situation in the East.

The movement in nails has been of particular interest, because it has been almost entirely independent of the other branches of the iron and hardware trades. Early in 1885 nails, under a very heavy supply, declined to low figures. Under the stimulus of a moderate spring demand, aided by some co-operation among manufacturers in the East, they rallied a little. They fairly held their own during the early summer months, until the beginning of the strike in the Western mills brought a potent element of improvement into the situation. The belief was at first general among both consumers and producers that the strike would not last long. The former did not anticipate future wants to any considerable extent, while the latter appeared content with a gradually hardening market. Stocks in makers' and dealers' hands were allowed to sink by degrees to a low ebb under a moderately active demand. Orders came flowing to the Eastern mills from the West, and suddenly the trade began to realize that, with little prospect of a general resumption of work in the West, the productive capacity of the mills running was incapable of meeting the current demand. Many circumstances combined to make this revision of feeling sudden. As usual, buyers, who had become accustomed to a steadily declining market, had to be taught by repeated advances that its firmness was not a fiction. The country was very bare of stocks, and in some quarters a nail famine was actually impending. Prices went up with a rush, which only tended to give more confidence to the striking nailers in the West. With few solitary exceptions, every mill in the East and South was crowded to full capacity at very remunerative rates, while the Western nail manufacturers, who were waging a contest with their men for a principle, stood their ground firmly under the most adverse circumstances. One thing which tended to keep prices in the West lower than they might otherwise have been was that freights were low. Another factor which tended to make the discrepancy between supply and demand less serious was that, after all, the latter was by no means heavy for the season. In times of general activity in building throughout the country the famine would have been more intense and more prolonged. Although some speculation entered into the situation, it did not assume any marked proportions, while on the other hand the great mass of dealers and consumers persistently pursued a hand-to-mouth policy.

Another factor the importance of which cannot be overrated was the wire nail, which

offered a splendid opportunity for its introduction, and the wire-nail manufacturers wisely improved it by a very conservative course. Their raw material was cheap then, and, while a number of advances were established, they followed the upward movement in cut nails at a distance, thus making every dealer and merchant an active partisan of the wire nail. We see on every hand the evidences of this wise policy. There can be no doubt that a very large number of important consumers have learned not alone to appreciate the economy of wire nails, pound for pound, at the established difference in prices, but that they have been taught to value them for many points of excellence they possess for special work. The wire nail has conquered territory which in the future it may claim as its own. The loss to the cut-nail makers is greater even than appears on the surface, because it affects sizes which are more remunerative than the ordinary assortments upon which the base is fixed.

Meanwhile the Western mills were steadily gaining ground with their feeders, and from week to week the number of machines reported to be in operation grew. With the approach of winter the demand, first from the North and the Northwest, showed symptoms of rapidly falling away. Almost simultaneously an advance was established in the rates of freight from Eastern mills to Western distributing centers, and the Eastern manufacturers saw themselves again narrowed down to their usual markets. In less than a month the price of carload lots in the New York market dropped from \$2.75 to \$2.25, with a few anxious sellers, some of them speculators, crowding the market only to frighten buyers by offering at low figures.

We have thus dwelt upon the history of the past six months in the nail trade because its happenings have considerable bearing on its future course. Some of the influences then at work are potent still, and other modifying factors are coming into play. The strike in the Western mills still continues, and, while the productive capacity has undoubtedly grown and is now fairly able to take care of the current demands, there can be no question that it would be unable to cope with the heavy requirements of the spring season. It is not impossible, therefore, that the West might at that time call for nails from the East. Meanwhile there are more nails being made in the latter section of the country than are wanted during the dull season. This the manufacturers recognize, and some of them have agreed to close down for four weeks during the period from January 1 to March 1. Others, fully aware of the necessity of replenishing stocks, are quietly piling up, content to await the recovery which is promised by the advent of spring. It looks, therefore, as though the early future would see in the Eastern markets a few anxious sellers.

When last spring the battle was raging between the steel and the iron nails, it was predicted freely that the latter would quickly disappear. The long strike crowded these issues aside, and now they are again coming forward, though in somewhat different shape. The advance in raw materials for steel manufacture will tell more on the steel-nail maker than will the rise in forge on the producers of iron nails, and, though old rails have been crowded upward, the balance is temporarily turning again in favor of the iron nail. When speaking of steel nails we of course allude to those produced from metal made in the regular Bessemer process, and not those from Clapp-Griffiths steel or old steel rails.

To some extent the wire nail, too, will be hampered. Rods, it is true, are still cheap, but wire has advanced considerably, and the cost of raw material in the making of the wire nail must be greater. On the other hand there has been a very rapid increase in the number of wire-nail machines, and we may expect that product to crowd on the market in increasing quantities. This will operate against the maintenance of a higher level for cut nails, which seems otherwise justified by small stocks and an advance in raw material. A careful study of the situation makes it difficult to assent to the views freely expressed by many that nails are bound to recede to old figures. We may expect some temporary weakness, but it does not look, with the light we now have on the subject, as if the low-water mark of 1884 will be again touched this winter.

As foreshadowed in our last issue, the prices for standard brands of pig iron at tidewater markets have been placed at \$18 for No. 1 foundry, \$17 for No. 2 and \$16 for gray forge. These figures have been repeatedly referred to in the public prints as being the same as those ruling for the previous contracts. That is not the case. There has been an advance of \$1 on the two lower grades. The prices thus fixed are certainly low. They prove that the leading companies are guided by a conservative spirit and are justly doing all in their power to discourage the "boomers." The latter will find it a somewhat difficult matter to frighten consumers into the belief that prices are bound to go up with a rush, when the largest producers tributary to this market are ready to sell large blocks at moderate figures. Of course we hear, as usual, at the present time of the great sales which always follow the announcement of prices. The trade has learned to attach very little importance to these big figures, because they cover contracts which have considerable

capacity for shrinkage. As one of the peculiarities of the Eastern iron trade, they are tolerated with benevolent regard for the sanctity of ancient usage.

The Exchanges for 1885.

The various annual exhibits of the New York exchanges and other business organizations for the year 1885 are generally favorable, showing an increased volume of transactions compared with the previous year. The sales on the Produce Exchange made at the "calls" comprise 59,500,000 bushels of wheat, nearly 24,500,000 bushels of corn, upward of 4,100,000 bushels of oats, and 100,000 tierces of lard, while the total margins deposited were \$25,582,000, which is a little under the aggregate of the previous year. Depression to some extent was occasioned by the feeble export demand, and the prohibitory decrees of France, Germany and Austria against pork products operate prejudicially to an important interest. On the Consolidated Stock and Petroleum Exchange the total transactions in petroleum for the year amounted to 3,604,949 barrels. The highest price during the year was on October 20 and 21, when petroleum sold at \$1.12½ per barrel; the lowest was on January 16, when it sold at 68 cents per barrel. The average price for the year was 88½ cents.

The transactions of the Stock Exchange compare as follows for two years:

	1882.	1883.	1884.
From	Cwt.	Cwt.	Cwt.
India	8,477,479	11,249,597	8,000,919
North and South America on the Atlantic	48,836,885	37,396,750	32,946,697
All American and other Pacific countries	14,712,393	11,506,637	8,284,810
Russia	9,571,021	13,533,358	5,401,964
Total	75,597,778	73,680,342	54,643,980

Railroad extension having a direct bearing on the future wheat supply, it is interesting to note that on April 1, 1885, there were in operation 12,004 miles. The number of passengers forwarded was 73,815,119 in 1884, against 65,098,953 in 1883, and there were forwarded 16,663,007 tons of goods. The gross earnings amounted to £16,066,225, expenses to £8,156,157, leaving £7,910,068 net earnings.

The public indebtedness on March 31, 1884, was:

Consolidated debt of India	£161,300,221
Floating debt	10,277,724

Total £171,577,945

The actual income and outlay for the years named were as follows:

1881-82	1882-83
Gross revenue.	Expenditure.
£275,141,601	£272,991,573
70,125,231	69,418,597

The budget estimates were as follows:

1884-85	1885-86
Gross revenue.	Expenditure.
£62,991,300	£70,707,490
72,000,400	71,582,900

The expenditure in 1883-84 included the following items:

Interest on the debt.	£476,266
Paid tax collectors.	£6,855,503
Police.	£2,761,054
Public schools.	£1,184,194
Aid extended to famine-stricken districts.	£1,500,000
Army.	£16,975,750
Public works.	£18,614,594
Loss sustained in exchange.	£3,838,756

The latter item is an unpleasant one, representing, as it does, the difference between gold and silver in paying in sterling such items abroad and at home as cannot be liquidated in the baser metal.

India's silver standard is one of the greatest drawbacks to its finances and trade, and the worst of it is that it has grown to such magnitude that the country cannot extricate itself.

But for the unlimited natural resources of this magnificent British possession, the financial and monetary outlook would be dismal in the extreme.

Trade of British India.

The development of Indian trade and the satisfactory headway we have been making of late years in our domestic export to that country are worth noting. The returns of the Secretary for India for 1884-85 show the following trade movement:

Imports.	Exports.
Rupees.	Rupees.
1884-85.....\$98,971,170,41	£1,471,861,417
1885-86.....28,152,201,366,000	1,856,654,585

The Clearing-House has now a membership of 64. Three banks were admitted to membership during the year, viz.: West Side, Seaboard National and Sixth National. The Union National Bank went into liquidation on the 1st of November last.

The report of the Sub-Treasury, furnished by Assistant Treasurer Acton, shows receipts amounting to \$713,862,200, and payments equal in amount, covering transactions for the entire year. While the volume of business in the various departments above represented has been large, low prices have yielded only moderate profits, but the outlook for the coming year is considered hopeful.

The following table shows the imports and exports for 1884-85:

Imports.	Exports.
Rupees.	Rupees.
1884-85.....\$98,971,170,41	£1,471,861,417
1885-86.....28,152,201,366,000	1,856,654,585

The following table shows the imports and exports for 1885-86:

Imports.	Exports.
Rupees.	Rupees.
1885-86.....\$98,971,170,41	£1,471,861,417
1886-87.....28,152,201,366,000	1,856,654,585

The following table shows the imports and exports for 1886-87:

Imports.	Exports.
Rupees.	Rupees.
1886-87.....\$98,971,170,41	£1,471,861,417
1887-88.....28,152,201,366,000	1,856,654,585

The following table shows the imports and exports for 1887-88:

Imports.	Exports.
Rupees.	Rupees.
1887-88.....\$98,971,170,41	£1,471,861,417
1888-89.....28,152,201,366,000	1,856,654,585

The following table shows the imports and exports for 1888-89:

Imports.	Exports.
Rupees.	Rupees.
1888-89.....\$98,971,170,41	£1,471,861,417
1889-90.....28,152,201,366,000	1,856,654,585

The following table shows the imports and exports for 1889-90:

Imports.	Exports.
Rupees.	Rupees.
1889-90.....\$98,971,170,41	£1,471,861,417
1890-91.....28,152,201,366,000	1,856,654,585

steel here was promptly reflected in higher rates of freight, because there was little prospect of getting anything to take back from this side. Unless our farmers and speculators allow grain to drop to prices which will induce buyers abroad to take hold this condition of affairs is likely to continue, and freights will be a greater factor than they have been in the past. What business has been done thus far has been on the basis of the lowest quotations for material abroad and low freights. Prices of goods and rates of freight both advanced materially, and now the business is practically checked. This will give our home producers more latitude to advance without giving foreign makers an opportunity to unload what are in some cases unprecedentedly heavy stocks. Of course such advances should be cautiously made, and we believe that those engaged in the manufacture of iron and steel are in accord on this point. They will do all they can to discourage wild speculation, since they have learned how disastrous it is to their best interests. They do not want to see hundreds of thousands of tons of foreign material coming in from abroad and a mushroom growth of new plants at home.

The cable brings a rumor that the present Government of England intend to introduce some sort of a protective tariff measure that will be retaliatory in its character—that is, that will levy duties upon imports from those countries that do not admit goods of English manufacture at rates that are satisfactory to England. This may be merely a rumor without foundation in fact, but in view of the utterances of some of the leaders of the party in power it is at least a plausible one. The Tory party is at heart a protectionist party. The demand of the English workingman, both the agricultural laborers and mechanics, for some protection is growing in intensity, and the answer to it is reported to be retaliatory tariffs. This may be human nature, but it is not statesmanship. England's efforts at retaliation and their results should have taught her not only their unwisdom, but their futility.

Condition of the Blast Furnaces of the United States, January 1, 1886.

We give on the next page our usual monthly report of the condition of the blast furnaces of the country. This is also what has heretofore been our quarterly report. But two furnaces are missing, both charcoal, one each in Utah and Oregon. The one in Utah is out of blast and of little or no importance, and the Oregon furnace does not affect the result, so that the report may be regarded as complete.

In a condensed form the table makes the following showing as to the condition of the furnaces January 1, 1886:

Fuel.	In blast.		Out of blast.	
	No.	Weekly capacity.	No.	Weekly capacity.
Charcoal	57	7,804	160	16,678
Anthracite	104	29,811	117	35,518
Bituminous	114	54,199	106	40,508
Total	275	91,814	392	82,704

This shows a marked change since the first of December. At that time the record was as follows:

Fuel.	In blast.		Out of blast.	
	No.	Weekly capacity.	No.	Weekly capacity.
Charcoal	61	8,860	163	15,582
Anthracite	94	26,816	125	38,438
Bituminous	99	49,790	122	44,917
Total	254	84,466	418	88,937

Twenty-one new furnaces, on the whole, are in blast, divided as follows: 4 less charcoal, 10 more anthracite, and 15 more bituminous. The decrease in the capacity of the charcoal furnaces in blast is about 550 tons weekly, the increase in the capacity of the anthracite about 3000, and of the bituminous some 4400. As a rule, the furnaces now blowing in are not of as large capacity as some of those that have been in blast. The increase in anthracite furnaces has been in New York and the Lehigh and Schuylkill valleys in Pennsylvania; in bituminous stacks, chiefly in the Shenango and Mahoning valleys and the Hanging Rock region. Other furnaces are preparing to blow in, and it is probable that February will find an increase, but not as marked as the past two months.

Since the first of October there has been a decided increase. At that time 75 anthracite furnaces, with a capacity of 20,318 tons, were in blast. January 1 it had increased to 104 furnaces, with 29,811 tons capacity. The bituminous furnaces had increased in the same time from 88, with a capacity of 43,234 tons, to 114, with a capacity of 54,199 tons.

The number of anthracite and bituminous furnaces in blast at the beginning of each month of the last year and the first month of the present, together with their weekly capacity, is as follows:

1885.	Anthracite.		Bituminous.	
	No. in blast.	Capacity per week.	No. in blast.	Capacity per week.
January 1	86	21,564	82	36,812
February 1	81	21,189	87	46,653
March 1	66	22,889	91	46,774
April 1	82	21,704	90	45,655
May 1	80	20,726	95	43,397
June 1	79	19,880	94	44,494
July 1	81	20,444	93	43,965
August 1	77	19,580	86	44,845
September 1	78	20,190	89	42,669
October 1	75	20,318	88	43,234
November 1	86	24,370	89	44,101
December 1	94	26,816	99	54,199
January 1	104	29,811	114	54,199

One year ago the condition of the furnaces and capacity were as follows:

Fuel.	In blast.		Out of blast.	
	No.	Weekly capacity.	No.	Weekly capacity.
Charcoal	88	8,871	159	15,941
Anthracite	86	21,564	169	28,500
Bituminous	82	36,812	141	56,812
Total	236	66,747	485	100,258

This shows a material increase during the year—18 anthracite furnaces and 32 bituminous. The year 1884 shows a reduction of 23 anthracite and 19 bituminous.

The relative condition of the blast-furnace industry for the past seven years is shown in the following condensed table of furnaces in and out of blast on the first days of January, 1880-86:

NUMBER OF FURNACES IN BLAST, JAN. 1.

1880.		1881.		1882.		1883.		1884.		1885.		1886.	
Charcoal	Anthracite												
89	162	155	123	78	48	57	162	159	169	169	169	162	162
185	182	169	169	199	86	104	182	182	182	182	182	182	182
136	151	142	108	101	82	114	136	136	136	136	136	136	136
Total	364	473	465	430	298	298	275	364	364	364	364	364	364

NUMBER OF FURNACES OUT OF BLAST, JAN. 1.

1880.		1881.		1882.		1883.		1884.		1885.		1886.	
Charcoal	Anthracite												
146	114	117	128	169	159	169	169	146	146	146	146	146	146
67	76	67	64	132	135	117	117	67	67	67	67	67	67
80	68	78	88	125	141	106	106	80	80	80	80	80	80
Total	293	256	262	280	416	435	392	293	293	293	293	293	293

Secretary Manning has issued the first bond call which has been published in over a year. This will be regarded with general satisfaction. The people of this country demand that the national debt shall be extinguished as rapidly as possible without risk or increased burdens, and that vast sums of surplus revenue shall not be hoarded by the Treasury for any purpose other than the legitimate needs of economical administration. Mr. Manning has shown what seems to be an excessive prudence in this matter, and in following the example of his official predecessors he has done wisely. It is true that he may have been led to this decision by the evidences of a gathering storm, of which the first gush was experienced in the speech of Senator Beck. The action of the Bank of England in raising its rate of discount to invite gold to London may also have influenced his action, when emphasized by the demand of the banks for gold to make good the exports. So able a financier as Mr. Manning could scarcely have questioned the ability of the Treasury to meet its obligations with \$400,000,000 available surplus, and since no better use can be made of money than to employ it in liquidating debts, we are glad that Mr. Manning has decided that a bond call can safely be made.

WASHINGTON NEWS.

(From Our Regular Correspondent.)

WASHINGTON, D. C., January 5, 1886.

It was expected when the House reassembled to-day that the committees would be announced. The Speaker, however, was not quite prepared, and the call of States for bills and resolutions for reference only was continued. Should the call be concluded to-day, it is possible that the list will be submitted. There has been much competition for chairmanships on the principal committees, which has caused some delay. The Committee on Ways and Means has been constituted in deference to the wishes of Mr. Morrison, and, so far as the Democratic Members are concerned, will represent his views.

THE SENATE COMMITTEE ON FINANCE.

The Senate Committee on Finance will take up the Cameron resolutions against reopening the tariff controversy as soon as some of the more urgent nominations shall have been disposed of. If the committee will make a report the resolutions themselves will lead to a lengthy discussion. In the House the issue will be made, and Mr. Morrison will be ready to submit his bill as soon as the House gets well settled down to business.

RECENT DECISIONS.

The following decisions have been rendered by the Secretary of the Treasury under the metal schedule:

Certain so-called crude mineral substance, which, upon analysis, was found to contain 67 per cent. of metallic manganese and 18 per cent. of metallic iron, was held to be entitled to free entry under the provision in the free list, T. I., new, 621, for "manganese, oxide and ore."

Small compasses, with a lead-pencil arranged on

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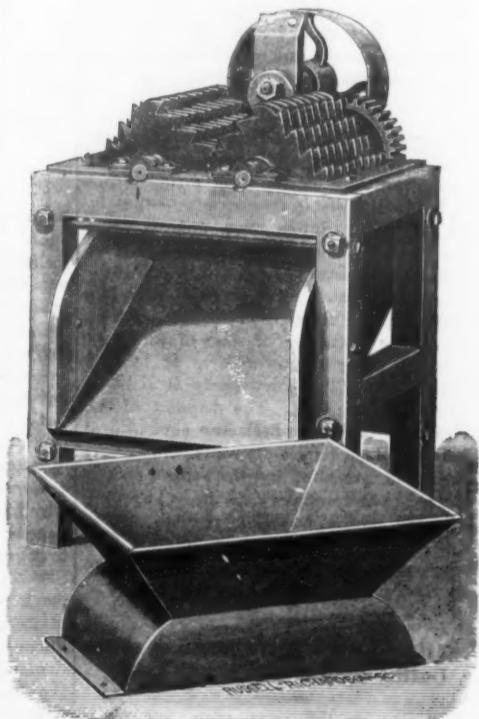
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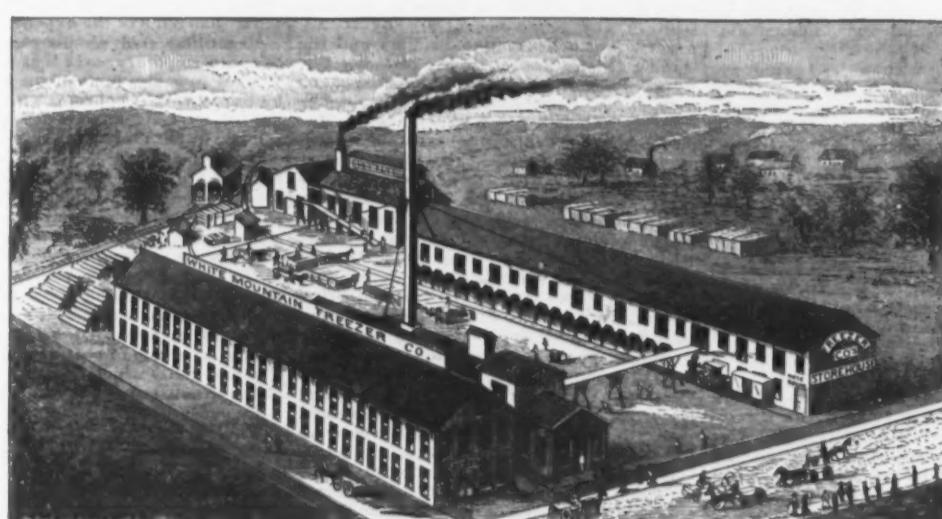
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Special Notices.

RECENT BOOKS.

Thurston.—*The Materials of Construction.* By Prof. Robert H. Thurston; 697 pages, 8vo, cloth. \$5.

This is an abridgement of the larger work in three volumes, entitled "The Materials of Engineering." The origin, nature, method of preparation and the properties of all the common and useful metals, and their strength, elasticity and other qualities essential to their introduction into the various constructions which the engineer is called upon to build or inspect, are treated of at considerable length, and the influence of the more common conditions affecting them is studied. The chapters on the reduction of the ores of the metals are substantially as complete as in the unabridged work. Those treating of the properties and uses of those metals are but slightly condensed, and the portion of the treatise relating to the alloys retains the more essential facts. In the condensation of the matter found in the original the effort has been to select for excision mainly the parts which give at great length the details of the less important processes and the less essential data obtained by experiment. The general and the average results have been retained. The value of the work is beyond question, and justly deserves and will undoubtedly gain wide popularity.

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Address "NORE,"
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Wanted.

MECHANICAL ENGINEER with good experience in Machinery for Iron and Steel Mills, &c., &c., for an extensive and well-established manufacturing concern. Preference would be given to one accustomed to selling large machinery and who has an acquaintance with the managers and engineers of leading mills in Pennsylvania and elsewhere. Address, Full particulars.

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For Manufacturing Purposes.

The attention of capitalists, manufacturers and others to whom cheap fuel and ready access to markets at competitive freight rates are important is directed to the advantages of natural gas as a market, and availability of a cheap and constant supply of Natural Gas for fuel, possessed by the boroughs of BEAVER FALLS, ROCHESTER, NEW BRUNSWICK, PITTSBURGH, and BRIDGEWATER, all situated in the beautiful valleys of the Ohio and Beaver Rivers, at and near the confluence of these rivers, in Beaver County, Pennsylvania. In addition to the navigable rivers, there are numerous canals, the following railroads, giving ready access with low freight rates to all desirable markets, to wit: The Pittsburgh, Ft. Wayne & Chicago; Cleveland & Pittsburgh; Erie & Pittsburgh; Pittsburgh & Lake Erie, and Marginal Railroad. The Beaver Falls is situated in a valley from its prolific field a constant and practically instantaneous supply of cheap fuel, increasing in volume with the development of the territory, and capable of indefinite expansion as demand arises. The nature of this gas is such that it is superior to coal gas, compiled at lower rates than in Pittsburgh or elsewhere, and its cheapness practically places at this point competition by those using coal or coke out of the question. Many of the larger iron and glass manufacturers are using natural gas, and are in great favor of natural gas, as well as numerous potteries, brick works and other industries, attesting its perfect suitability and superiority for the most diverse purposes for which fuel is needed. The situation of the boroughs is remarkable, situated in a valley, with a high, perfect, and communication and transportation between the several parts of the valley by railroad and street railway are unsurpassed. The gas is supplied from numerous wells west of Pittsburgh, and together contain, practically living in a continuous centre of population, upward of thirty thousand inhabitants. Information can be had from the said boroughs. Full particulars and fuel rates furnished on application to Thomas F. Galey, Supt., Rochester, Pa., or at the branch office of the under-signed, No. 113 Fourth Avenue, Pittsburgh, Pa. Correspondence invited.

THE BRIDGEWATER GAS COMPANY,
J. J. VANDERGRIFT, Pres.

TO PARTIES WHO REQUIRE
PERFECT CASTINGS.

Before placing your contracts for GRAY IRON CASTINGS for 1886, we should be pleased to quote prices and show you samples, being confident of our ability to give very low figures, especially to large consumers. Using only the finest No. 1 Pig Iron, the purest Connellsville Coke and best Albany Sand, this foundry has obtained an extended reputation for producing a superior quality of soft, sound and smooth Castings, true to pattern and of requisite strength. Our Castings are carefully inspected, cleaned and packed, tumbled bright when practicable, securely packed and delivered, f.o.b., freight paid to principal points in New England and New York, and can be packed, cleaned, tumbled, packed, planed, japanned or bronzed; also Wood or Metal Patterns and fine Brass and Composition Castings. Would take contracts for small Machines or Specialties in Hardware, &c. To manufacturers contemplating removal, would say we have rooms to rent, with power, also substantial brick building, on railroad track, for sale or rent, suitable for heavy or light manufacturing. There is no better railroad center or location for manufacturing and distributing goods than Springfield. We solicit correspondence or personal interview.

Respectfully, THE SPRINGFIELD FOUNDRY CO.,
93 W. Liberty St., Springfield, Mass.

Smelting Works For Sale Cheap.

\$1000 cash, balance in ten-year mortgage; consisting of two fine Buildings, Furnaces, Boilers, Engines, Root Blowers, large Steam Pumps, Pipes, Tanks, &c., all new nine months ago, and in perfect order; also a 99-year lease on ten acres of fine land. If a buyer is not found at once, I will sell any part to suit purchaser.

H. M. SCIPLE,
107 and 109 N. Third St., Philadelphia, Pa.

Hardware Business For Sale.

A small, well-assorted stock of Hardware, Tinware and a good set of Tinner's Tools, in town of Locke, Cayuga County; a rare chance for a practical Tinner who has about \$1000 to invest.

Address H. S. DUNNING,
Auburn, N. Y.

For Sale.

The Davenport Plow Co., one of the oldest and best known Plow factories in the West, is for sale. The Buildings, Machinery and Tools are all in good condition and the entire property and good-will of said company can be bought at reasonable figures. For further particulars, apply to DAVENPORT PLOW CO., Davenport, Iowa.

Wanted.

A partner with \$3000 or \$4000, to take half interest in a well-established Hardware Store and Vehicle Business; business situated in the best section of Virginia, in good growing town. For particulars, address "F. F." Box 19, Office of The Iron Age, 83 Reade St., New York.

Wanted.

Planer and Boring Mill, with all the latest improvements; Planer to have capacity of 8 by 20 ft.; Boring Mill 8 to 10 ft.

Address N. A. RAIL MILL CO.,
New Albany, Ind.

WANTED, by a thoroughly competent Hardware man of seven years' experience, a situation as traveler or other good position with manufacturer or jobber. References of late employers. Address "J. D." Box 19, Office of The Iron Age, 83 Reade St., New York.

WANTED, MALLEABLE CASTINGS.

Manufacturers in this line to contract for Belt Fasteners. Specifications furnished on application. Address "B. H. Co." Box 19, Office of The Iron Age, 83 Reade St., New York.

A young man desiring practice in mechanical draughting wants situation. Good Penman and Mathematician. Salary no object.

Address "A. A." Box 88, Office of The Iron Age, 83 Reade St., New York.

Wanted.

TRAVELING SALESMAN. One of experience and extended acquaintance with the wholesale Traveling Trade East and West may give entire time to our line or take one or more non-conflicting lines. Salary or commission.

Address "MANUFACTURER," Office of The Iron Age, 83 Reade St., New York.

FOR SALE—A well-established Stove, Plumbing, Tinware, Slating, Glass and Crockery business, doing a good paying trade; has large orders on hand; situated in a thriving town within 50 miles of New York City. This is a chance seldom offered. Must be sold, as the proprietor has another business to attend to. Address "D. L." Box 34 Water St., New York.

WANTED.

An office assistant Hardware Buyer. State age, experience had, and salary expected.

"C. D. & CO."

P. O. Box 264, New York.

Special Notices.

SPECIAL NOTICE.

WE ARE NOW OFFERING

SPECIAL DISCOUNTS

ON

SHAFTING COUPLINGS, HANGERS AND PULLEYS.

The Edison Shafting Mfg. Co.,

86 to 92 Goerck St., New York.

CATALOGUES AND PRICE LISTS MAILED
ON APPLICATION.

RECEIVER'S SALE

OF

MACHINE SHOP, FOUNDRY AND
BLACKSMITH SHOP.

All Materials, Machinery, Tools, Fixtures and Personal Property in the Iron Foundry, Machine Shop and Blacksmith shop of G. H. Zeschec & Co., Nos. 180 to 190 South Pennsylvania St., Indianapolis, Indiana, are offered for sale by order of Court.

Said Iron Foundry and Shop are in good running condition. The place is well established. Circular and Band Saw Mills and all other articles usually made in a first-class foundry are successfully manufactured here.

Private offers for all or any part of the property will be received by the receiver at any time before February 14, 1886, and will be at once reported to the Court.

Sealed bids on all or any part of the property, in cash or upon such terms as may be offered, will be received at any time before noon, February 15, 1886.

All the property will be offered at public auction on the premises, in parcels and as an entirety, at one o'clock p. m., on February 15, 1886, excepting one Planer and certain Patents, which will be offered separately. The terms of sale at auction will be one third cash, one-third in six and one-third in twelve months. At the conclusion of the auction sale the sealed bids will be opened and reported to the Court.

All offers are subject to the approval of the Court.

A complete inventory and appraisement will be mailed on application.

JAMES JOHNSON,
Receiver of G. H. Zeschec & Co., Indianapolis.

REMOVAL.

On the 1st of January, 1886, we will move to the spacious building 707 Broadway, where we will still continue to manufacture the largest and best line of Dog Collars and Furnishings to be found in the world.

MEDFORD FANCY GOODS CO.,

207 Broadway, New York.

Send for Catalogue of 1886, issued on the 15th of January.

To Capitalists and Manufacturers.

For Sale as a whole or in parts to suit, in Westmoreland County, Pa., in and adjoining the Borough of Parnassus, 18 miles from Union Depot, Pittsburgh, 350 acres; over two-thirds level river bottom above highest water; under beautiful residence sites, equal to those of Tarentum gas pipes; 10-foot vein of coal under all, and gas rises along the whole seven-eighths of a mile on river front. For descriptive circulars, address JAS. W. DRAPE & CO., Pittsburgh, Pa. or ALEXANDER YOUNG, Parnassus, Pa.

SCRAP

WANTED Steel and Iron Scrap, Rails, Tires, Axles, Turnings, Boring, Malleable and Burnt Iron, &c.

SCOTT & SMEDLEY,
455 Walnut street, PHILADELPHIA, PA.

Dealers in every description of Iron and Steel.

WANTED.

A thorough business man with capital to join the advertiser in forming a Joint Stock Corporation for the purpose of manufacturing a valuable hardware specialty thoroughly covered by patent. They have a fine manufacturing property well located on the Connecticut River, close to rail and water communication; factory large and well supplied with Power, Tools and Machinery. A party to furnish the working capital and manage the financial part of the business would complete arrangements for a large and very profitable business. Any one seriously interested in this business will please address "A." Lock Drawer No. 2, Post Office, Hartford, Conn.

WANTED—A position in the Iron, Steel, Heavy and Carriage Hardware Business as Salesman by a gentleman who has traveled ten years and who is well and favorably known to the trade buyers and consumers in twenty States. Is energetic and reliable; understands thoroughly the Crucible and Low Carbon Steels, Carriage Springs and Axles, Merchant Iron and Nails; most unexceptionable references; is also expert bookkeeper. Address MARION, Office of The Iron Age, 83 Reade St., New York.

WANTED—A position in the Iron, Steel, Heavy and Carriage Hardware Business as Salesman by a gentleman who has traveled ten years and who is well and favorably known to the trade buyers and consumers in twenty States. Is energetic and reliable; understands thoroughly the Crucible and Low Carbon Steels, Carriage Springs and Axles, Merchant Iron and Nails; most unexceptionable references; is also expert bookkeeper. Address MARION, Office of The Iron Age, 83 Reade St., New York.

WANTED—A young man with five years' experience in the Hardware business, as Clerk in Hardware store; can give unquestionable reference.

Address Post Office Box 124, Lewistown, Penna.

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Address Post Office Box 124, Lewistown, Penna.

WANTED—A young man with five years' experience in

Special Notices.

Second-hand Machinery For Sale.

One Engine Lathe, 16 ft. bed, 45 in. swing. Bement's make.
One 20-ft. bed 96 in. Chucking and Boring Lathe.
Two Engine Lathes, 87 in. swing, 20 ft. 6 in. bed, Geared in Face Plate, Screw Feed, Compound Rest.
One Iron Planer, planes 24 ft. long, 69 in. x 65 in. Excellent condition.
One Iron Planer, planes 12 ft. long, 75 in. x 72 in. Bement's make.
One Iron Planer, planes 10 ft. long, 60 in. x 60 in. Bement's make.
One Iron Planer, planes 8 ft. long, 30 in. x 30 in. Two Iron Planers, plane 6 ft. long, 24 in. wide.
Three Iron Planers, plane 4 ft. long, 24 in. x 24 in. Three " " 5 ft. long, 20 in. x 20 in. One 1750-lb. Bement Steam Hammer. Excellent. One Small Steam Hammer.
One 5-foot Radial Drill.
One 40-inch B. G. S. F. Upright Drill. N. Y. Steam Engine Co.'s make.
Two Slitting Machines, 6-in. stroke. Bement's make.
One 10-inch Shaping Machine.
One Axle Lathe, for car axles.
Two Durrell's " Spindle Saw Tappers.
Send for lists New and Second-hand Tools, too long for publication.
Sole Agents EDISON SHAFTING MFG. CO.

The GEO. PLACE MACHINERY CO.,
121 Chambers and 108 Reade Streets,
NEW YORK.

SECOND-HAND MACHINERY

IN GOOD ORDER.

One 20 x 48 Corliss Engine.
One 18 x 36 Hor. Engine, built by Jacob Navier.
One 14 x 15 Vertical Engine, New York Safety Steam Power Co.
One 14 x 20 Hor. Engine, Campbell & Rickards.
One 12 x 42 Corliss Engine.
One 12 x 15 Supple Engine Co.
One 6 x 12 H. P. Stapler Engine and Boiler.
One 6 x 12 Vertical Boiler.
One 6 x 12 Locomotive Boiler.
One 6 x 12 Hor. Tubular Boiler.
One 40 x 12 Hor. Tubular Boiler.
One 16 x 6 Harrington Lathe.
One 17 x 6 Hartford Engine Lathe.
One 16 x 12 Engine Lathe, New Haven.
One 38-inch swing Column Drill, New Haven.
One 50-inch Vertical Boring Mill.
Also complete outfit for a Sash and Door Factory, including Planers, Moulding Machines, Band Saws, Tenoning Machines, Upright Moulding Machines, Scroll Saws, Mortise Saw Benches, &c., all modern Tools, but little used.

HENRY I. SNELL

135 North 3d Street, Philadelphia, Pa.

E's and B's.

The largest and most reliable stock of Engines and Boilers in America. All sizes and styles, and all made of the very best material at lower prices than common, cheap country-made work can be sold. These Engines are all made interchangeable by special machinery. Agents wanted, and orders from the Trade solicited.

Write for Illustrated Catalogue and particulars.

H. M. SCIPLE,

107 and 109 N. Third St., Philadelphia, Pa.

HOISTING ENGINES.

New 10 H.-P. worm-gearred Hoisting Engines; Steam Cylinder 6 in. bore, 8 in. stroke; geared 16 to 1; Drum 20 in. diameter, 18 in. long. Improved Cone Friction for Hoisting and Lowering. Also 6 in. x 6 in. Wilkins' Improved Spur-Gear Hoister, with Clutch and Link Motion. Drum 8 in. x 16 in. A. G. BROOKS,
261 N. Third Street, Phila.

FOR SALE.

15 Lever Lard Presses complete.
Lot of Lard Press Parts and Plates.
3 Cast-Iron Surface Scrapers.
1 large Screw Press (Hand).
75 tons extra heavy Cast Scrap.
ROBERT MOFFLY & CO.,
N. E. cor. 9th and Jefferson Sts.,
Philadelphia.

For Sale, Cheap.

One 20 x 48 Horizontal Corliss Engine.
One 16 x 48 " "
One 60-lb. Air Cushioned Hammer. Merrill & Son's make.
One 100-lb. Spring Hammer. Peenelt & Gerhard.
One No. 5. Blake Steam Pump.
One No. 3. Deane "

D. B. CRUCKSHANK,
243 Dyer St., Providence, R. I.

FOR SALE.

ROOT BLOWERS, Nos. 16, 1, 2, 3, 4, 5 and 7.
BAKER BLOWERS, Nos. 16 and 2.
STUDER BLOWERS, 1, 2, 3, 4, 5, 6, 7, 8, 9 and 10.
SUGAR HOUSE MACHINERY, Vacuum Pans, Tanks, Wagons, &c.
ENGINES, 10X16, 14X24, 10X30, 8X14, 6X12, 3X6, &c.
WANTED: MACHINERY: Root Blowers, Power and Baking Mills' sizes 16 to 24 ft. long, 20 to 30 ft. 20 ft. H.-P. Horizontal Engines, at order. LARG. SIEVES for Scrap Iron; a large STEAM HAMMER for blooms; Variety Moulder and Band Saw; a Ventilating Fan. C. E. BIGELOW, W. E., 45 Day St., New York City.

LEIGH'S

DISCOUNT BOOK,

Specially arranged for the use of the
HARDWARE TRADE.

Acknowledged by ALL the best work of the kind
ever published. Price by mail ONE DOLLAR.

Address E. B. LEICH,

Sec'y The American Brake Co., St. Louis, Mo.

Traveling Salesman Wanted.

A competent, energetic and pushing Salesman, to sell goods well known to the Hardware trade; must be familiar with the Hardware business, and experienced in selling goods on the road; liberal arrangements will be made with the right party. Address " M. D. & Co." Office of The Iron Age, 83 Reade St., New York.

WANTED

by the Hudson River Ore and Iron Co., a thoroughly competent and practical Chemist who is conversant with Iron Ores. Address, giving references, and stating salary expected.

J. N. STOWER, Superintendent,
Burden, N. Y.

Special Notices.

BOOKS.

LAMBERTSON'S

HARDWARE PRICE BOOKS,

LARGE SIZE.

500 Pages, 6 x 10 1/2 inches. Revised and improved.

PERFECTION ATTAINED.

Alphabetical Arrangement. Leather Tab Index. Flexible Leather. Rounded Corners.

EACH \$8.00.

POCKET EDITION. FLEXIBLE LEATHER,

With Flap. 250 pages, 4 x 7. Each \$4.00.

DISCOUNT BOOK.

Cloth, \$7.50. Leather, \$3.00.

Sent, postpaid, to any address, on receipt of price, by B. LAMBERTSON, Portland Oregon; David Williams, 83 Reade St., New York; A. F. Shapleigh & Cantwell Hdw. Co., St. Louis, Mo., or William Blair & Co., Chicago, Ill.

ENGINES & BOILERS.

NEW AND SECOND-HAND.

The following new Slide Valve Engines guaranteed complete and first class:

One 18 x 24. One 10 x 12.

One 10 x 24. One 8 x 12.

One 12 x 16. One 8 x 10.

One 12 x 20. One 8 x 9.

Also One 12 x 30 Corliss Engine. New.

One 14 x 24 Adjustable Cut-Off Engine. New.

Also the following, Second-hand, guaranteed in good condition:

One Corliss Cut-Off, 18 x 42.

One " 14 x 48.

Two Wrights " 22 x 42.

One " 18 x 32.

One Vertical Safety Power, 14 x 18.

One " 16 x 24 Adjustable Cut-Off.

One 10 x 90 "

One 10 x 90 Plain Slide Valve.

One 10 x 90 "

Large stock assorted sizes new and latest Improved English and American makers, estimates and specifications furnished for Mills and Factories. Send for Circulars and Catalogues.

THE NEWELL UNIVERSAL MILL CO.,
10 Barclay Street, New York.

METALLURGICAL ENGINEERING.

I am prepared to furnish

PLANS, SPECIFICATIONS and
ESTIMATES

AND TO

SUPERINTEND THE CONSTRUCTION OF ROLLING MILLS AND MACHINERY, RE-
GENERATIVE GAS FURNACES,
TUBE AND PIPE MILLS,
Etc., Etc.I represent the latest improvements in all the
above branches.M. V. SMITH, Metallurgical Engineer,
Room 9, Bissell Block, Pittsburgh, Pa.

For Sale.

Second-hand

DROPS and LIFTERS.

BEECHER & PECK,
Lock Box 122, New Haven, Conn.

FOR SALE, MACHINERY.

Planer, 24 in. x 24 in., to plane 6 ft. New. \$375.
" 27 in. x 26 in. " 8 ft. " 300.
Lathe, 18 in. x 6 ft. \$16. 16 in. x 6 ft. ditto. 10 ft. 20-ft. 20-ft.
Pulley Lathe, 28 in. x 16 ft., with Boring Atmt. \$920.
New Speed Lathe, Heavy. \$45. 40. \$60. \$75.
Pack Gear Drill Press. New. 28-in. swing. Modern
style. \$175.
Rock Cut Paper. Heavy. 4 spindles. \$100.
Improved Nut Machine, for 1-in. Nuts and under. \$100.
Ten large Improved Portable Forges at \$100.

YORK & BENTON, Cleveland, Ohio.

For Sale.

House, Lot and Store and a twelve years' es-
tablished business in Hardware, Stoves and Tin-
ware in Summit, N. J.; terms reasonable; reason
for selling, poor health. For further particulars,
inquire ofW. I. & S. G. NEGUS & CO.,
17 Warren St., New York City.

A. J. SWEENEY & SON,

WHEELING, W. VA.

Solicit correspondence with parties desiring

Machinery, &c. Complete outfit for Nail Fac-
tories and Rolling Mills.

Wanted to Buy.

Old Iron and Steel Wire Rope, Burnt Iron

Address, stating price, quantity, &c.

SITES, GILL & CO.,
222 and 224 So. Third Street,

Philadelphia, Pa.

Malleable Iron Plant for Lease at Youngstown,
Ohio.

The property is well located on or near several

lines of railroads and is one of the best shipping

points in the State. Brick buildings equipped with

all machinery necessary for the manufacture of

malleable iron. Foundry 75 x 30 x 7 ft. Engine

House 40 x 20 x 12 ft. Property could be utilized

for other manufacturing purposes with small outlay,

and will be leased on reasonable terms. For further

particulars, address MALLEABLE IRON WORKS,

Youngstown, O. Care A. H. RICE.

For Rent.

FACING MILL, consisting of a run of six Mills

(lower runners), Machinery Appertaining, in complete

order, and supplying the trade daily. Further infor-

mation inquire of S. HERANCOURT,

Kindel and Central Ave., Cincinnati, O.

A Traveling Salesman of many years' experi-

ence would like to form an outside connection

with small manufacturer of saleable patented

novelties. Address " M. W. R. "

Office of The Iron Age, 83 Reade St., New York.

NOTICE.

Large Buyers of Shafting are requested to send

specification for special prices.

MERWIN MCKAIG,
Cumberland, Md.

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MERWIN MCKAIG,
Cumberland, Md.

Large

Trade Report.

New York Iron Market.

American Pig.—The opinion advanced in our last issue that prices would be fixed at \$16, \$17 and \$18 has been verified, the announcement having been made openly soon after we went to press. It is regarded from widely different standpoints by those in the trade. The motives which prompted placing prices on so moderate a level are avowedly to keep Southern and Scotch Irons out of this market, and to discourage the blowing in of an additional number of furnaces in the Schuylkill and Lehigh valleys. The conservative element in the trade applaud the move as wise and judicious. Some furnace men disagree with this opinion, holding that higher prices would have been obtained for the asking. Others are probably dissatisfied with it because they had hoped that a higher level been established they would have found it an easy matter to book orders at a concession. Consumers would look upon it with varying sentiments. Some appear to be ready to accept the terms as probably the best attainable for the year, and the usual reports of large sales are put forth. Others seem content to take their chances for summer delivery, arguing that later on they may do better. They argue that a number of furnaces have already gone in who may be counted upon to be eager sellers a few months from now. On the other hand, we know that there are buyers who, though they have requirements covered for the next 90 days, will closely watch the market to contract for summer delivery whenever the slightest sign of weakness appears. They openly express their belief that Pig Iron will be higher. Some furnace men hold the same views and are loth to enter into long-time contracts. They profess to be willing to let others fill up at present prices, feeling that they will realize more by waiting. While, therefore, the majority both of sellers and of buyers approve of the action taken, there are quite a number in the trade who hold different views. That the prices are unexpectedly low to some furnace men is evidenced by the announcement of the Chickies Iron Co. that they have restored their figures to \$18 for No. 1, \$17 for No. 2 and \$16 for Gray Forge. We quote for Standard brands, tidewater delivery, \$18 @ \$18.50 for No. 1 X Foundry, \$17 @ \$17.50 for No. 2 X Foundry, and \$16 @ \$16.50 for Gray Forge. Outside brands are 50¢ below these quotations.

Scotch Pig.—The market is dull and unchanged. The low prices of American Pig Iron are not calculated to encourage importations. We quote nominally as follows for small lots: Coltness, \$20.50 @ \$21 to arrive; Gartsherrie, \$20 @ \$20.50 to arrive; Shotts, \$20.50 @ \$21 to arrive; Carnbroe and Glengarnock, \$19.50 to arrive; Summerville, \$20 @ \$20.50 to arrive; Dalmellington, \$19 @ \$19.50 to arrive; Eglington, \$18 @ \$18.50 to arrive, and Clyde, \$18.50 @ \$19 to arrive.

Bessemer Pig.—There is very little doing. Buyers' and sellers' views are too far apart for business. We hear that \$19.50 has been offered for a block of 10,000 tons of Foreign, but declined. We quote, \$20 @ \$20.50, nominally.

Spiegeleisen.—No business is reported this week, and prices remain nominally \$28 for 20%; \$32 @ \$32.50 for 30% Spiegeleisen, and \$67 for 80% Ferromanganese.

Bar Iron.—The market is stiffer. We hear of sales of round lots of Common Iron on dock at 1.55¢ @ 1.60¢, and of higher prices realized for Refined Iron of well-known brands. The advance in Old Material has caught the very mills which are usually the lowest sellers in this market, since they have been buyers of Old Rails only from hand to mouth, while the larger mills are well stocked. A meeting of the Bar-Iron manufacturers is to be held in Philadelphia at an early date, with the avowed object of advancing prices. Such a movement, if judiciously guided, seems to have in it the elements of success, though it would be a grave error to attempt to do too much at once. We quote for delivery here in round lots: Common Iron, 1.55¢ @ 1.60¢; Medium, 1.60¢ @ 1.75¢, and Refined Iron, 1.80¢ @ 1.9¢, with half extras. Store prices are 1.75¢ @ 1.80¢ for Common, 1.80¢ @ 1.90¢ for Medium, and 1.95¢ @ 2¢ for Refined.

Structural Iron.—The event of the week has been the placing of the contract for the Omaha Bridge of the Union Pacific, at figures which are lower than any yet known, the Union Bridge Co. being the lowest bidder. This proves that as yet, for desirable orders in large quantities, there has not been any advance on Structural Iron. We quote Angles 1.95¢ @ 2¢, delivered, and Tees at 2.25¢ @ 2.35¢ for round lots. Steel Angles are quoted 2.35¢ @ 2.45¢, according to quality. Store quotations remain 2.2¢ @ 2.4¢ for Angles, and 2.5¢ @ 2.7¢ for Tees. American Beams and Channels are 3¢ base from dock for all orders.

Plates.—Those mills known for the high quality of their product are asking more money, but as yet no general advance has been established. We quote for round lots: Common or Tank, 2¢ @ 2.1¢; Refined, 2.4¢ @ 2.5¢; Shell, 2.4¢ @ 2.5¢; Flange, 3.4¢ @ 3.5¢; Extra Flange, 4¢ @ 4.5¢. For small

lots of Steel Plates the quotations are as follows: Ship, 3¢ on dock; Tank, 2.5¢ on dock; Boiler, 3¢ @ 3.5¢ for Shell, 3.5¢ @ 4¢ for Flange, and 4¢ @ 5.5¢ for Extra Flange and Fire-Box.

Merchant Steel.—Associated Press dispatches allude to the meeting referred to in our last issue, placing the date of the gathering at January 7th. Quotations for the range from ordinary to good grades are as follows: American Tool Steel, 7.5¢ @ 10¢; Tool Steel of special grades and finer qualities, 12¢ @ 20¢; English Tool, 13.5¢ @ 15.5¢; Common grades, 7¢ @ 9¢; Crucible Machinery, 4.5¢ @ 6¢; Spring and Tire, 2.5¢ @ 2.5¢; Open-Hearth Machinery, 2.5¢ @ 2.5¢, and Bessemer Machinery, 2¢ @ 2.5¢.

Steel Rails.—There are rumors of large sales, aggregating 40,000 tons in all, East and West. The only transaction of which anything definite is known is the sale of 10,000 tons to the Union Pacific, by the Cleveland Rolling Mill Co., at private terms. The market is firm, the majority of the mills asking \$35. Few of them are in shape to fill the early delivery which buyers usually demand. It is reported that the Western Steel Co., lessees of the old Vulcan Mill, at St. Louis, have been offered an allotment by the Board of Control of 60,000 tons. The capacity of the Rail mills has become the subject of a controversy in the columns of the *Times*, between Mr. Andrew Carnegie and Hon. Abram S. Hewitt. The former holds that the producing capacity of the mills is not now greater than it was in 1882, when the product was 1,284,000 gross tons, while Mr. Hewitt places it at 2,000,000 tons, presumably net tons, or, roughly, 1,700,000 gross tons. Mr. Carnegie argues that there can be no growth in the Rail capacity, because now a much larger quantity of ingots is used for other purposes. While it is true that the use of Steel for structural and other purposes has grown rapidly, it must not be forgotten that a number of new plants have been built to fill that demand. Some of the older mills are paying less attention to Rails than they did formerly, but it is not too much to say that the works of the Scranton Steel Co., with their phenomenal capacity for so small a pair of converters, largely counterbalances this. Then every old plant in the country has been either remodeled or has been improved by new machinery. There is stimulus enough in \$35 for Rails to drive all but two or three to full capacity if the market should call for it. Therefore Mr. Carnegie's estimate seems certainly too low, while that of Mr. Hewitt is evidently too high. The truth probably lies between the two, and 1,500,000 gross tons may be accepted as a fair estimate of capacity at present figures.

Steel Wire Rods.—There is little doing. We hear of a sale of 1,000 tons at \$41.50. We quote nominally \$42 @ \$42.50.

Old Rails.—Two steamers have this week arrived with about 1,200 tons of English Double-Head Rails, which were freely offered previous to arrival, but found no buyers, and were ordered into store. Other lots are known to be on the way. They are freely offered at \$22.50, ex-steamer. The Boston syndicate, which has purchased heavily during the past month, appear to be ready to take only Rails made by New England and Troy mills. We hear of one sale of 1,500 tons of American Tees, f.o.b. at Eastern port, at private terms, and of two lots aggregating about 800 tons at \$20, delivered at New York. The market has been disturbed by the arrival of the English Rails referred to and by offerings of some round blocks of American Rails. It appears now that the movements of the Boston syndicate have almost exclusive reference to that market, which will only take a few specified brands of American Rails, consumers in New England evidently not caring to touch others.

Scrap.—Holders continue to ask \$19 @ \$20 from yard for No. 1 Wrought.

Rail Fastenings.—We quote 2.25¢ for Spikes, 2.75¢ for Bolts and Square Nuts, 2.9¢ @ 3¢ for Bolts and Hexagon Nuts, and 1.75¢ @ 1.75¢ for Splice Bars.

Metal Exchange.

The following transactions are reported to have taken place on the floor of the Metal Exchange:

WEDNESDAY, December 30.
300 tons Pig Iron Certificates, March \$18.12 1/2
THURSDAY, December 31.
600 tons Pig Iron Certificates, March 18.12 1/2

Philadelphia.

Office of *The Iron Age*, 220 South Fourth St., Philadelphia, January 5, 1886.

Pig Iron.—The year opens on a firm, but somewhat irregular, market, although, on the whole, the tendency is toward higher figures. The action of the Thomas Iron Co. in fixing the price of No. 1 X at \$18 at tide has given a slight check to the market for the time being, but if nothing unforeseen occurs prices are still likely to work toward higher figures. This statement is based on the evident feeling among both consumers and producers, and also upon the very limited supply of Iron that is being offered for sale. If other companies were soliciting prices at \$18.50 or \$19 there might be room for suspicion that prices would not hold, but, so far as this market is concerned, the tendency is just the reverse, and, although good brands of No. 1 X can be picked up at \$18.50 @ \$19, they are certainly not going

a begging at these figures. There is quite a possibility that prices may have reached their highest limit for their present, but the chances appear to be that the Thomas Iron Co., large producers as they are, will have to sell another 50,000 tons, perhaps more than that, before buyers show signs of repletion. In point of fact, it is stated and very generally believed that they (the T. I. Co.) are not by any means anxious for business at their own prices, and discriminate very closely when anything of importance is offered to them. Still the increase in production is assuming large proportions, and, in spite of the general improvement in business, it is good policy to go slow and wait developments. If the present rate of production proves to be equal to consumption the Thomas Iron Co. have done a good thing in trying to prevent too rapid an advance, not only for themselves, but for the trade at large; but, if they have underestimated the market, so much the better for customers who have taken the Iron, while leaving their competitors to secure orders at whatever advance the market may afford. In this connection it should be stated that the company above named have advanced the price of their other grades \$1 1/2 ton, and, as a good deal of their No. 1 X was sold at \$17.50 during the summer months, the advance averaged on their entire product is not far from \$1 1/2 ton. A considerable amount of business has been done during the past four or five days, and there are still a great many orders waiting to be placed. Prices, as we have said, are very irregular, and, although \$16, \$17 and \$18 at tide are the Thomas Iron Co.'s prices, a very large proportion of the business done has been at higher figures. Other good brands are held at from 50¢ to \$1 1/2 ton more money, and it is only once in a while that a seller will meet the Thomas Iron Co.'s prices. A fair average of the market would be \$16.25 @ \$16.50 for Gray Forge, \$17 @ \$17.50 for No. 2 X, and \$18.50 @ \$19 for No. X, with still higher prices for special brands. At this writing the market may be called irregular, but firm, with a good inquiry and light offerings.

Foreign Iron.—There is nothing doing, the high prices asked making it impossible to do business. Bessemer, \$20 @ \$20.50; 20% Speigel, \$29; holders firm.

Muck Bars.—The market is very active, and prices are higher. Large sales have been made at \$28 @ \$28.50 at mill; \$29 @ \$29.50 now asked, and no disposition to make cancellations.

Blooms.—There is rather more inquiry, and sellers are inclined to ask an advance. Latest sales (per Bloom ton, delivered) as follows: Charcoal Blooms, \$51 @ \$52; Run-out Anthracite, \$41 @ \$42; Scrap Blooms, \$32 @ \$33, and Ore Blooms, \$33 @ \$34.

Bar Iron.—There is a decided improvement in the demand, and prospects of a very considerable business being done within a few days. Orders are offered from a variety of sources, carbuilders showing more interest in the market than they have done for months past. Without any specially large lots actually closed, the feeling is strong, and confidence that prices can be maintained appears to be steadily growing. The usual rates are 1.8¢ @ 1.85¢ for Best Refined Bars, and 1.65¢ @ 1.7¢ for medium quality.

Plate and Tank Iron.—There is a fair demand for Plates, but as the mills are all pretty well employed the disposition is to advance prices, although in an irregular and somewhat spasmodic way. Consumers find it impossible to duplicate orders placed during last month, so that prices may be fairly quoted about a tenth higher, although in some cases a still greater advance is asked. In ordinary cases prices are about as follows: Ordinary Plate, 2¢ @ 2.1¢; Tank, 2.1¢ @ 2.2¢; Shell, 2.5¢; Flange, 3.5¢; Fire-Box, 4.25¢; Steel Plates, Shell, 3.25¢; Flange, 3.5¢; Fire Box, 4¢.

Structural Iron.—In sympathy with other departments the feeling is firmer, and prices probably a tenth higher, although in special cases orders may have been taken at only a very slight advance on recent quotations. Still, in view of the generally improved outlook for business, sellers show a strong front, and quote firmly at about the following prices: 2¢ @ 2.05¢ for Angles; 2.1¢ @ 2.2¢ for Bridge Plate; 2.4¢ @ 2.5¢ for Tees, and 3¢ for Beams and Channels.

Sheet Iron.—There is a good demand for Sheet Iron, considering the season, but as yet no change in prices has been made, although the impression is almost universal that an advance is only a question of a very short time. Meanwhile quotations are firm, as follows:

Best Refined, Nos. 26, 27 and 28 4¢
Best Refined, Nos. 18 to 25 3¢ 1/2
Common, 1/2¢ less than the above 3¢ 1/2

Best Bloom Sheets, Nos. 26 to 28 5¢
Best Bloom Sheets, Nos. 22 to 25 4¢ 1/2

Best Bloom Sheets, Nos. 16 to 21 4¢

Blue Annealed 3¢

Best Bloom, Galvanized, discount 57 1/2¢

Common, discount 52 1/2¢

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many maintaining that the small stocks at the mills and in the hands of the dealers, coupled with the prospect of an early spring demand, must result in a marked advance. Others claim that Nails have already established a material advance over last year's figures and that with the additional machines that the manufacturers are gaining daily there will be a supply equal to the wants of the country at the present figures. Be this as it may, there is no effort noticeable on the part of the mills to push off their product. Steel Nails are to be had only in limited quantities, and the difference between their price and that of Iron Nails is now so marked that the latter are moving freely as they come in.

Wire.—The advance in Wire is wonderfully well sustained. We doubt if there was ever more thoroughly concerted effort to put up the price with better success. The demand is good and promises to be much better as people acquire confidence in the situation. The only obstacle which there can be to a prosperous business in the South is the low price of farm products. Farmers are holding on to their cotton and other staples in the hopes of better prices in the future. It has cost them, however, so much less to raise the crop, owing to the reduced prices of Implements and supplies of all kinds, except possibly live stock, that they may figure out a profit at what seem unprecedently low values. At any rate, the new year's business will force a movement of some kind.

GEORGE H. HULL & CO., of Louisville, report to us as follows, under date of January 5: The market for Pig Iron during the past week has been very active, sales for about 12,000 tons having been booked at full prices. The advance has not only been thoroughly established, but nearly everything offered in the way of Gray Mill at \$15.50 and No. 1 Mill at \$16 is readily sold. The furnaces are continuing in the same position—that is, discouraging everything tending to a further advance, and, although some will not quote at all, others, so far as ability will allow, are endeavoring to set the demand at full market prices. We quote for cash in round lots as below:

PIG IRON.	
Southern Coke, No. 1 Foundry	\$18.00 @ \$18.50
" No. 2	17.00 @ 17.50
" No. 2½ "	16.50 @ 17.00
Hanging Rock Coke, No. 1 Foundry	18.50
Hanging Rock Charcoal, No. 1 Foundry	18.00 @ 20.00
Southern Charcoal, No. 1 Foundry	18.00 @ 20.00
White and Mottled, different grades	17.50 @ 17.00
Southern Coke, No. 1 Mill, Neutral	16.00 @ 16.50
" No. 2 "	15.50 @ 15.00
" No. 1 " Cold Short	15.50 @ 16.00
Southern Charcoal, No. 1 Mill	16.50 @ 17.00
White and Mottled, different grades	17.50 @ 17.00
Southern Car-Wheel, standard	18.00 @ 18.50
Hanging Rock, Cold-blast	18.00 @ 21.00
Warm-blast	18.00 @ 21.00

Old Material.—The market for Old Material is quiet. Old Rails and Car-Wheels the large difference between the views of buyers and sellers has not been harmonized, and sales, in consequence, have been small: Rails, \$1 ton. \$20.00 @ \$21.50

Wheels, \$1 ton. 14.50 @ 15.00

No. 1 Wrought, \$100. 70 @ 75

No. 2 Country Wrought, \$100. 50 @ 60

No. 1 Cast, \$100. 45 @ 50

Boilers, cut, \$100. 60 @ 65

Boilers, uncut, \$100. 40 @ 45

Axes, \$100. 90 @ 95

Flues, Tanks and Sheets, \$100. 25 @ 30

Burned Scrap, \$100. 30 @ 30

St. Louis.

W. H. SHIELDS, 305 Olive street, St Louis, reports, under date of January 4: Trade is somewhat quiet, with less inquiry. A large contract was let here the past week, to run through the year 1886, at a less figure than the contract price of 1885. The general foundry trade shows no improvement:

CHARCOAL FOUNDRY.—\$16.50 @ \$18.00

Southern. 18.50 @ 19.50

COAL AND CORK FOUNDRY.—16.50 @ 18.00

Southern. 17.50 @ 18.50

American Scotch. 18.00 @ 21.00

MILL IRON.—20.00 @ 24.00

Southern. 21.00 @ 23.00

CAR-WHEEL AND MALLEABLE IRONS.—Old Wheels. 16.00 @ 17.00

Old Rails. 16.00 @ 21.50

Connelleville Coke (East St. Louis). 5.50 @ 5.50

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de Report.

General Hardware.

We give below the principal changes in price which are announced with the opening of the year. It will be noted that, while they are not all in the way of advances, the general movement, in a moderate and quiet way, is toward slightly better prices. The general feeling for the coming season is hopeful, with the expectations of a good volume of trade and perhaps slightly advanced prices.

BARD WIRE.

The market is firm, quotations remaining 4.62 $\frac{1}{2}$ cents for carload lots of Four-Point Barb Wire, 4.75 cents for 3-ton lots, and 5 cents for small lots. The manufacturers will hold another meeting on the 15th of January, at which the advisability of a further advance will be discussed. Tomorrow the manufacturers chiefly interested in the export trade will hold a meeting in this city to settle the question, which has been pending for some days, whether the price for export is to be advanced to 4 cents or 4.25 cents.

NAILS.

The market has been quiet, and, while there are a few sellers ready to make low prices, the majority of the manufacturers maintain a firmer attitude. With the stoppage of four weeks agreed to, the prospects of a heavy spring demand and the stiffening in raw material, they believe in the policy of not crowding the market. We quote carload lots of Iron Nails at \$2.25 on dock, while store prices are \$2.40 to \$2.50. We discuss the situation editorially.

SCREWS.

The trade will receive with satisfaction the announcement that there has been the advance in the price of Screws to which we have in recent issues referred as likely to occur, and will observe the new discount sheet of the American Screw Co., which we give in another column, in which their discount on Flat Head Iron Screws is made 75 and 10 per cent. where it has been 80 per cent., an advance of about 10 per cent., with changes also in the other lines. The Russell & Erwin Mfg. Co., in a circular dated January 1, make a corresponding advance, advising the Hardware trade that until changed by them their discounts and terms for Wood Screws will be as follows, from their revised list prices of April 1, 1885:

Flat Head Iron... \$31 $\frac{1}{2}$
Round Head Iron... \$31 $\frac{1}{2}$
Flat Head Brass... \$31 $\frac{1}{2}$
Round Head Brass... \$31 $\frac{1}{2}$
Flat Head Bronze Metal... \$31 $\frac{1}{2}$
Round Head Bronze Metal... \$31 $\frac{1}{2}$

Flat Head Iron Screws, Blued, 2 $\frac{1}{2}$ per cent. advance on net.

They also withdraw and cancel all discounts and terms on Screws made prior to the date of the circular. The Charles Parker Co., Meriden, Conn., and 97 Chambers street, New York, also announce that they have adopted the following discounts from their present list prices of Wood Screws, in which it will be observed that a slight change is made in the quotation of the Round Head Iron and Round Head Brass Screws, in order to facilitate the ease of calculating an unusual and awkward discount:

Flat Head Iron Screws... dis. 80 $\frac{1}{2}$
Round Head Iron Screws... dis. 80 $\frac{1}{2}$
Flat Head Brass Screws... dis. 80 $\frac{1}{2}$
Round Head Brass Screws... dis. 80 $\frac{1}{2}$

Add 2 $\frac{1}{2}$ per cent. to the net price for Blued Screws.

The following companies also make a corresponding advance, but their circulars announcing it have not yet been received:

THE UNION STEEL SCREW CO., Cleveland, Ohio.

P. & F. CORBIN, New Britain, Conn.

ATLANTIC SCREW WORKS, New York.

It is understood that the Massachusetts Screw Co. also unite in this advance, but we are not in receipt of positive advices to this effect.

BRASS KETTLES.

The Association of Brass Kettle Manufacturers, for whom O. W. Graves is agent, 21 Cliff street, New York, announce January 2 that the price of Spun Brass Kettles for less than 500 pounds has been fixed as follows:

17 inch and under... 22 $\frac{1}{2}$ per cent.
18 inch and over... 24 $\frac{1}{2}$ per cent.

the terms being f. o. b. New York, cash in 30 days. In quantities of 500 pounds or more to be taken at one purchase and delivery and thereafter to the same purchaser during the season prices are as follows:

17 inch and under... 20 $\frac{1}{2}$ per cent.
18 inch and over... 22 $\frac{1}{2}$ per cent.

These prices are announced as subject to change without notice, and no deduction will be made for stock in hands of purchasers when change is made. The manufacturers who unite in these prices are as follows:

ANSONIA BRASS AND COPPER CO., Ansonia, Conn.

BROWN & BROTHER, Waterbury, Conn.

EDWARD MILLER & CO., Meriden, Conn.

G. C. HUSSEY & CO., Pittsburgh, Pa.

WATERBURY BRASS CO., Waterbury, Conn.

THE STANLEY RULE AND LEVEL CO.,

New Britain, Conn., and 29 Chambers street, New York, under date of January 1, 1886, issue the following revised discount sheet, which applies to their last illustrated catalogue of January 1884. Since that date four additional pages (40 $\frac{1}{4}$, 40 $\frac{1}{2}$, 38 $\frac{1}{4}$ and 38 $\frac{1}{2}$) have been issued, the latter two pages accompanying the present discount sheet, a description of some of the Tools contained

in them being given among our Hardware Novelties on page 37. It will be observed that some modifications are made in the discounts, most of those being, however, on the less important lines. The discount sheet is as follows, there being an additional discount of 10 per cent. for cash within 30 days:

Discount per cent.

Awl Hafts...	45	Swedes and Charcoal Iron Shoe Nails...	84 $\frac{1}{2}$
Awls, Patent Pegging...	45	Swedes Iron English Heel Nails, all sizes...	84 $\frac{1}{2}$
Awls, Awl-Handled...	45	American Iron English Heel Nails, 4-8 inch and longer...	54 $\frac{1}{2}$
Beavers, Stanley's Universal...	30	Zinc Shoe Nails...	10 $\frac{1}{2}$
Bevels, Sliding T...	60	Zinc Shank Nails...	16 $\frac{1}{2}$
Bevels, Patent Sliding Eureka...	45	Diamond Head Zinc Nails...	10 $\frac{1}{2}$
Box-Scraper, Adjustable...	30	Inch... 2-8 & 24 $\frac{1}{2}$ 3-8 34 $\frac{1}{2}$ 4-8 & longer...	10 $\frac{1}{2}$
Carpenters' Tool Handles...	25	Cts. per lb... 30 25 22 20	Per pound.
Cat Tie...	30	Cat Tie... 2-8 & 24 $\frac{1}{2}$ 3-8 & 34 $\frac{1}{2}$ 4-8 & longer...	10 $\frac{1}{2}$
Countersinks, Wheeler's Patent...	25	Cts. per lb... 16 14 13	
Dado, Filler-Pl. Plow, &c., combined...	20	Cat Tie... 2-8 & 24 $\frac{1}{2}$ 3-8 & 34 $\frac{1}{2}$ 4-8 & longer...	10 $\frac{1}{2}$
Dado, Adj-u-table...	20	Cat Tie... 2-8 & 24 $\frac{1}{2}$ 3-8 & 34 $\frac{1}{2}$ 4-8 & longer...	10 $\frac{1}{2}$
Drill, Brad Awl...	20	Cat Tie... 2-8 & 24 $\frac{1}{2}$ 3-8 & 34 $\frac{1}{2}$ 4-8 & longer...	10 $\frac{1}{2}$
Hand Beader, Stanley's Universal...	30	Cat Tie... 2-8 & 24 $\frac{1}{2}$ 3-8 & 34 $\frac{1}{2}$ 4-8 & longer...	10 $\frac{1}{2}$
Handies, Brad Awl...	20	Cat Tie... 2-8 & 24 $\frac{1}{2}$ 3-8 & 34 $\frac{1}{2}$ 4-8 & longer...	10 $\frac{1}{2}$
Handies, Plane...	40	Cat Tie... 2-8 & 24 $\frac{1}{2}$ 3-8 & 34 $\frac{1}{2}$ 4-8 & longer...	10 $\frac{1}{2}$
Handies, Saw...	40	Cat Tie... 2-8 & 24 $\frac{1}{2}$ 3-8 & 34 $\frac{1}{2}$ 4-8 & longer...	10 $\frac{1}{2}$
Handies, Screw Driver...	50	Cat Tie... 2-8 & 24 $\frac{1}{2}$ 3-8 & 34 $\frac{1}{2}$ 4-8 & longer...	10 $\frac{1}{2}$
Hammers, Tack No. 4...	30	Cat Tie... 2-8 & 24 $\frac{1}{2}$ 3-8 & 34 $\frac{1}{2}$ 4-8 & longer...	10 $\frac{1}{2}$
Hammers, Steak...	30	Cat Tie... 2-8 & 24 $\frac{1}{2}$ 3-8 & 34 $\frac{1}{2}$ 4-8 & longer...	10 $\frac{1}{2}$
Hammers, Upholsterers'...	70	Cat Tie... 2-8 & 24 $\frac{1}{2}$ 3-8 & 34 $\frac{1}{2}$ 4-8 & longer...	10 $\frac{1}{2}$
Mallets, Hickory and Lignumvitae...	20	Cat Tie... 2-8 & 24 $\frac{1}{2}$ 3-8 & 34 $\frac{1}{2}$ 4-8 & longer...	10 $\frac{1}{2}$
Miter Box, Improved...	25	Cat Tie... 2-8 & 24 $\frac{1}{2}$ 3-8 & 34 $\frac{1}{2}$ 4-8 & longer...	10 $\frac{1}{2}$
Miter Squares, Improved...	25	Cat Tie... 2-8 & 24 $\frac{1}{2}$ 3-8 & 34 $\frac{1}{2}$ 4-8 & longer...	10 $\frac{1}{2}$
Plumb and Levels, Non-Adjustable...	70	Cat Tie... 2-8 & 24 $\frac{1}{2}$ 3-8 & 34 $\frac{1}{2}$ 4-8 & longer...	10 $\frac{1}{2}$
Plumb and Levels, Patent Adjustable...	70	Cat Tie... 2-8 & 24 $\frac{1}{2}$ 3-8 & 34 $\frac{1}{2}$ 4-8 & longer...	10 $\frac{1}{2}$
Plumb and Levels, Nicholson's Patent...	70	Cat Tie... 2-8 & 24 $\frac{1}{2}$ 3-8 & 34 $\frac{1}{2}$ 4-8 & longer...	10 $\frac{1}{2}$
Plumb and Levels, Iron Frame...	25	Cat Tie... 2-8 & 24 $\frac{1}{2}$ 3-8 & 34 $\frac{1}{2}$ 4-8 & longer...	10 $\frac{1}{2}$
Plumb and Levels, Iron Wood...	70	Cat Tie... 2-8 & 24 $\frac{1}{2}$ 3-8 & 34 $\frac{1}{2}$ 4-8 & longer...	10 $\frac{1}{2}$
Plane, The Stanley Adjustable, Iron and Wood...	70	Cat Tie... 2-8 & 24 $\frac{1}{2}$ 3-8 & 34 $\frac{1}{2}$ 4-8 & longer...	10 $\frac{1}{2}$
Plane, The Stanley Adjustable, Iron and Wood...	70	Cat Tie... 2-8 & 24 $\frac{1}{2}$ 3-8 & 34 $\frac{1}{2}$ 4-8 & longer...	10 $\frac{1}{2}$
Plane, The Stanley Adjustable, Iron and Wood...	70	Cat Tie... 2-8 & 24 $\frac{1}{2}$ 3-8 & 34 $\frac{1}{2}$ 4-8 & longer...	10 $\frac{1}{2}$
Plane, Beading...	20	Cat Tie... 2-8 & 24 $\frac{1}{2}$ 3-8 & 34 $\frac{1}{2}$ 4-8 & longer...	10 $\frac{1}{2}$
Plane, Bull-nose Rabbit...	20	Cat Tie... 2-8 & 24 $\frac{1}{2}$ 3-8 & 34 $\frac{1}{2}$ 4-8 & longer...	10 $\frac{1}{2}$
Plane, Chamfer...	20	Cat Tie... 2-8 & 24 $\frac{1}{2}$ 3-8 & 34 $\frac{1}{2}$ 4-8 & longer...	10 $\frac{1}{2}$
Plane, Rabbet...	20	Cat Tie... 2-8 & 24 $\frac{1}{2}$ 3-8 & 34 $\frac{1}{2}$ 4-8 & longer...	10 $\frac{1}{2}$
Plane, Scraper and Tooth Plane...	20	Cat Tie... 2-8 & 24 $\frac{1}{2}$ 3-8 & 34 $\frac{1}{2}$ 4-8 & longer...	10 $\frac{1}{2}$
Plane, Scraper and Tooth Plane...	20	Cat Tie... 2-8 & 24 $\frac{1}{2}$ 3-8 & 34 $\frac{1}{2}$ 4-8 & longer...	10 $\frac{1}{2}$
Plane, Tongue and Groove...	20	Cat Tie... 2-8 & 24 $\frac{1}{2}$ 3-8 & 34 $\frac{1}{2}$ 4-8 & longer...	10 $\frac{1}{2}$
Plane, Trammel Points...	20	Cat Tie... 2-8 & 24 $\frac{1}{2}$ 3-8 & 34 $\frac{1}{2}$ 4-8 & longer...	10 $\frac{1}{2}$
Tool Handles and Tools, Excelsior...	20	Cat Tie... 2-8 & 24 $\frac{1}{2}$ 3-8 & 34 $\frac{1}{2}$ 4-8 & longer...	10 $\frac{1}{2}$
Try Squares...	60	Cat Tie... 2-8 & 24 $\frac{1}{2}$ 3-8 & 34 $\frac{1}{2}$ 4-8 & longer...	10 $\frac{1}{2}$
Try Squares, Adjustable Iron Handle...	60	Cat Tie... 2-8 & 24 $\frac{1}{2}$ 3-8 & 34 $\frac{1}{2}$ 4-8 & longer...	10 $\frac{1}{2}$
Try Squares, Improved Iron Handle...	60	Cat Tie... 2-8 & 24 $\frac{1}{2}$ 3-8 & 34 $\frac{1}{2}$ 4-8 & longer...	10 $\frac{1}{2}$
Try Squares, Standard...	60	Cat Tie... 2-8 & 24 $\frac{1}{2}$ 3-8 & 34 $\frac{1}{2}$ 4-8 & longer...	10 $\frac{1}{2}$
Try Squares, Plumb and Level...	60	Cat Tie... 2-8 & 24 $\frac{1}{2}$ 3-8 & 34 $\frac{1}{2}$ 4-8 & longer...	10 $\frac{1}{2}$
Try Square and Bevel, combination...	60	Cat Tie... 2-8 & 24 $\frac{1}{2}$ 3-8 & 34 $\frac{1}{2}$ 4-8 & longer...	10 $\frac{1}{2}$
Try and Miter Square, Winterbottom's...	60	Cat Tie... 2-8 & 24 $\frac{1}{2}$ 3-8 & 34 $\frac{1}{2}$ 4-8 & longer...	10 $\frac{1}{2}$
Veneer Scrapers...	60	Cat Tie... 2-8 & 24 $\frac{1}{2}$ 3-8 & 34 $\frac{1}{2}$ 4-8 & longer...	10 $\frac{1}{2}$

The following are the list prices of the goods contained in their extra pages, 38 $\frac{1}{4}$ and 38 $\frac{1}{2}$, above referred to:

Stanley's Patent Floor Plane...

No. 74, 10 $\frac{1}{2}$ inches in length, 2 $\frac{1}{2}$ -inch Cutter... \$4.50

Stanley's Patent Universal Hand Beader...

No. 66, Iron Stock, with 6-inch Steel Cutters... \$1.00

Extra Cutters or Blanks for same... .05

Stanley's Patent Improved Chamfer Plane...

No. 75, Iron Stock, 9 inches in length, 1 $\frac{1}{2}$ -inch Cutter... \$2.0

Brass Shot Shells, First Quality.—Dis. 70 %.	
No 10, $\frac{1}{2}$ and $\frac{3}{4}$ inches per 100.	\$10.00
No. 12, $\frac{3}{4}$ and $\frac{5}{8}$ inches per 100.	10.00
Brass Shot Shells, X Quality.—Dis. 75 %.	
No. 10, $\frac{1}{2}$ and $\frac{3}{4}$ inches, per 100.	\$8.00
No. 12, $\frac{3}{4}$ and $\frac{5}{8}$ inches, per 100.	8.00

At a recent meeting of The Northwestern Plow and Cultivator Association, which is said to comprise all manufacturers west of the Alleghenies, the following resolutions were adopted:

In view of the recent advance in the price of raw material and the prospect of further advances in the near future,

Resolved, That no further concessions be made in prices other than those already made.

Resolved, That, should there be further advances in raw material, it will be necessary to follow the same by an immediate meeting and advance in the prices of Plows and Cultivators to correspond.

Resolved, That we limit the amount of goods to be made for the spring trade of 1886 to actual orders.

The manufacturers of Tackle Blocks are caused some annoyance and apprehension by the fact that some leading jobbers are selling Blocks at figures lower than the schedule of prices adopted by the association justify. They refer to the measures taken to give regularity to the prices of these goods and protect the different interests as having worked thus far very satisfactorily, and regret to see indications of irregularity. The hope, however, is expressed that these irregular prices will not long be offered.

The Norway Carriage and Tire Bolt Association, which has been in successful operation for one year, held its annual meeting on the 30th ult., in New York. To strengthen the association a money forfeit was agreed upon, also a percentage on sales, to be paid into the treasury monthly. A rebate was voted to be paid the jobbers who purchase a specified amount in a given time. After making a slight advance in price the meeting adjourned.

The Axe manufacturers, who have had repeated conferences of late, are in session to-day, endeavoring to complete the arrangements for regulating the Axe market. At this writing the result of their deliberations is not announced, but from the manner in which the manufacturers regard the matter, and the substantial agreement there is among them, it is thought likely that a strong combination will be formed and the price of Axes be advanced.

The Auburn Mfg. Co., Auburn, N. Y., who are represented here by J. C. McCarty & Co., 97 Chambers street, issue a circular December 29, to the effect that any verbal or written quotations on Steel Goods made by the company or by any of their travelers or agents, and not accepted previous to that date, are annulled. This announcement does not apply to the prices of Malleable Rakes, Wood Goods or Edge Goods.

The manufacturers of Axe, Hammer, Pick and other Handles have made a slight advance in the price of the goods.

The manufacturers of Hoes, Rakes and Forks have recently been in conference and agreed upon an advanced figure as the extreme below which they will not sell the goods. This action has a decided tendency to stiffen the price, but jobbing houses who were pretty well supplied have not generally made any change in their quotations.

The association of the Bolt, Nut and Washer manufacturers, making the better grade of goods named below, quote the following revised and advanced discounts, referring at the same time to the market as firm, with some probability of a further advance:

Machine Bolts.....	dis. 75 & 5 %
Bolt Ends.....	dis. 75 & 5 %
Square Nuts.....	84 & 5 % off
Hexagon Nuts.....	94 & 5 % off
Washers.....	84 & 5 % off
Lag Screws.....	dis. 75 & 10 %

In lots of less than 100 lb. of a size $\frac{1}{2}$ & $\frac{3}{4}$ lb. extra is added to the price of Nuts and Washers, as heretofore.

A joint circular is issued January 2, by J. C. McCarty & Co., 97 Chambers street, New York, agents for L. Coes & Co., and John H. Graham & Co., 113 Chambers street, New York, agents for A. G. Coes & Co., confirming existing prices for Coes' Genuine Screw Wrenches of either make, including L. Coes & Co.'s Knife Handle, at 60 per cent. discount from list. Mechanics' Wrenches made by L. Coes & Co., and similar quality by A. G. Coes & Co., will continue to rate at 10 per cent. less than the Genuine. A special discount of 10 per cent. will be allowed on specified orders for 50 dozen for immediate shipment, terms 90 days, or 3 per cent. discount for cash in 10 days. Parties having purchased the quantity will be entitled to the extra discount on subsequent orders during balance of season ending June 30, but this quantity must be taken from either one or other manufacturer, and includes only the Coes' Genuine Pattern or L. Coes & Co.'s Knife Handle, and not the Mechanics' Wrenches made by L. Coes & Co., or a similar quality made by A. G. Coes & Co., the price of either being 10 per cent. less than the discount, and are subject to the same quantity schedule.

BUSINESS CHANGES.

Announcement is made, under date December 31, 1885, by J. C. McCarty and William H. Littell, who refer to their circular issued April 14, 1885, that the copartnership heretofore existing between them under the firm name of Durrie & McCarty is dissolved by limitation. Either partner will sign in liquidation. Under date January 1, 1886, the same gentlemen give notice that they have formed a copartnership under the firm name of J. C. McCarty & Co., for the

purpose of engaging in the Hardware commission business as successors to the firm of Durrie & McCarty. They express their appreciation of the confidence hitherto reposed in them in their former relations by their principals and the trade.

W. H. Jacobus, who was for some years connected with Sise, Gibson & Co., and Donald McKay, widely known as the representative of the Morris Sash Lock Mfg. Co., which has now become the Ireland Mfg. Co., Cincinnati, Ohio, issue, January 1, a notice of the co-partnership they have formed under the style of W. H. Jacobus & Co., for the purpose of conducting a Hardware business as manufacturers' agents, their office being 90 Chambers street, New York. A full line of such goods as they represent will be carried in stock, but announcement is not yet made concerning the manufacturers whom they will represent.

Announcement is made, January 1, of a partnership between Arthur G. Sherman and William S. Fearing, of this city, under the firm name of Sherman & Fearing, for the transaction of a general domestic and foreign purchasing and commission business. Both these gentlemen have a wide acquaintance with the trade, Mr. Sherman being known as the representative in this market of a number of prominent jobbing houses of the country, and Mr. Fearing from his long connection with Brown & Brothers, Waterbury, Conn., with whom it is understood he will retain his relations, continuing to be their representative in the sale of Brass and Copper. His familiarity with Metals and the Metal market will be of value to the concern, who advise us that they are intending to make a specialty of this line in connection with the purchase of Hardware. As purchasing agents they propose to represent none but the best houses, whom, they advise us, they will bring directly into contact with the manufacturers from whom the goods are bought, and so not come under the head of what are known as syndicate buyers. These gentlemen, who are widely known and have the confidence of the trade, will have the best wishes of all for their success.

We are authorized to announce that the firm of the Morris Sash Lock Mfg. Co., Cincinnati, Ohio, was organized January 1 as a stock company, to be known as the Ireland Mfg. Co., and will continue the manufacture of Builders' Hardware, as heretofore done by the Morris Sash Lock Mfg. Co., at the old stand, 78 to 84 Harrison street, in that city. In announcing this change the Ireland Mfg. Co. respectfully solicit a continuance of the favors of the trade.

The house of John C. Jewett & Sons, Buffalo, N. Y., has become the John C. Jewett Mfg. Co., John C. Jewett retiring, as announced in the following card which appears in the catalogue of the company, just issued:

BUFFALO, January 2, 1886.

In retiring from this business after an active participation in it for over one-third of a century, the undersigned wishes to return his heartfelt thanks to the long list of customers and friends whose confidence he has so long enjoyed. He also desires to embrace this opportunity to recommend his successors, his two sons and son-in-law, who, having grown up in the business, are thoroughly conversant with every detail thereof and fully able to manage it successfully and to the satisfaction of all concerned.

Of the company thus organized Edgar B. Jewett is president, Risley Tucker secretary, and Frederick A. Jewett, treasurer. In their circular to the trade, referring to the retirement of Mr. Jewett and the consequent change in the organization of the house, the company say:

Referring to the foregoing announcement, we wish to say that the business of manufacturing Refrigerators, Ice Chests, Bird Cages, Water Filters, Water Coolers, Toilet Ware, Coal Vases, &c., will be carried on in future in the same manner and on the same principles as have won for this house such a high reputation during the administration of Mr. John C. Jewett, now retiring. Whatever virtue there may be in honest goods and fair dealing, we claim for us as an inheritance of more actual value in business than a heavy bank account.

They then refer to their purpose to maintain the excellence of their goods, and allude to their facilities for manufacturing. The list covers a large and varied assortment of the different lines which are familiar to the trade, most of which have been represented in former catalogues, the present one, however, containing some additions which will be of interest. The trade will look with confidence to the company as thus organized for the carrying out of the policy which has given their house its high position, with the hope it may enjoy continued success and prosperity.

Announcement is made that C. M. Miller dissolved his connection with S. A. Haines on the 31st ult., and that S. A. Haines and C. M. Hopkins continue under the firm name as before. S. A. Haines & Co. are now occupying their new and more commodious quarters, 90 Chambers street, where they have better accommodations for handling their increasing lines of goods.

Announcement is made of an important change in the business of one of the oldest and best known Hardware houses in the country. Pratt & Co., Buffalo, N. Y., having decided to retire from the wholesale Hardware business, have sold to Walbridge & Co., of their city, their entire stock of Shelf Hardware, and command their customers in this line to them. They, however,

retain Iron, Steel Nails and Spikes, Horse-shoes, Heavy Hardware and Metals at the old stand, where they will be pleased to receive orders as heretofore. From the circular of Walbridge & Co., announcing to the trade this consolidation of the Hardware business of Pratt & Co. with their own, we make this extract:

We will for the present remain at the old stand, Nos. 44 to 50 Terrace, heretofore occupied by Pratt & Co., and will carry the same standard brands of goods and extensive assortment for which their house has been widely and favorably known, and it shall be our earnest endeavor to maintain the reputation for fair and honorable dealing which they have enjoyed during the 50 years which have elapsed since their house was established. We shall continue to use the catalogues of General Hardware issued by Messrs. Pratt & Co., and will send out discount sheets and corrections from time to time, as may be deemed expedient. We beg to remind our friends, however, that it is impossible to advise them closely of the fluctuations of the market, and assure them that all orders with which they may favor will be filled at the lowest current prices. In addition to the lines of goods purchased of Messrs. Pratt & Co., we shall continue as heretofore to carry stock of Tin Plates, Sheet Iron, Copper, &c.; also of Lamps and Kerosene Fixtures of all kinds. It is 17 years since our own house commenced business in this city, and we take this occasion to convey our sincere thanks for past favors to our old customers, with many of whom we have enjoyed intimate and pleasant relations during the whole or a great portion of this period.

The houses concerned in this change, who are widely and favorably known, will have the best wishes of the trade for their success under the new arrangement.

J. Stevens & Co., Chicopee Falls, Mass., manufacturers of the Stevens Firearms, Fine Machinists' Tools, &c., have sold out their business to the new corporation just formed under the name of the J. Stevens Arms and Tool Co., with the following officers: Joshua Stevens, president; William B. Fay, Joshua Stevens, George S. Taylor, directors; Irving H. Page, secretary; James E. Taylor, agent and treasurer. The company thus organized took possession of the business January 1st, 1886.

ITEMS.

W. B. Belknap & Co., Louisville, Ky., present to the trade with their new year's greeting a circular of Plow Material and kindred lines, representing with illustrations Hames, Horse Collars, Plow Shapes, Clevises and a number of other articles of interest to the trade. They refer to their assortment as having been enlarged and their stock increased both in extent and variety, and allude to the prices of the class of goods illustrated as now so low that they cannot fail to prove a good investment.

The White Mountain Freezer Co., Nashua, N. H., make an exhibit of some of their leading Freezers in their announcement on page 24, where, it will be observed, they illustrate their Hand or Power Freezer, New Platform Freezer, adapted especially to hotels, restaurants, &c., Sand's Family Ice Crusher, the White Mountain Hand Freezer, &c.

The Paddock-Hawley Iron Co., St. Louis, issue their illustrated trade circular for 1886, covering their well-known line of goods, including an assortment of Wagon and Carriage Hardware, Trimmings and Wood Material, Horse Nails, Horseshoes, &c., and an extensive variety of miscellaneous goods. The National Tubular Axle is prominently represented and its special features explained.

Our readers will observe on page 18 the advertisement of the A. F. Pike Mfg. Co., Pike Station, N. H., in which they present illustrations of many kinds of small Stones for sharpening Edge Tools, a line in which they are such extensive manufacturers. They advise us that they have recently very much increased their business and enlarged their facilities for production, so that they are in a position to supply almost anything in the Oil Stone and Scythe Stone line.

I. E. Swift, Ishpeming, Mich., issues a large and effective calendar similar to the one to which we called the attention of our readers last year, each sheet, besides the calendar of the month, displaying some of the leading goods sold by Mr. Swift. His business is devoted especially to Heavy Hardware, Mine, Railway and Mill Supplies.

Chas. B. Holdrege, Bloomington, Ill., representing the Simmons Hardware Co., of St. Louis, issues in artistic and attractive form a new year's card to his customers and friends.

Merchant & Co., Philadelphia and New York, opened January 1 an office at 135 Lake street, Chicago, where it is their purpose to carry in stock a full line of their guaranteed Roofing Plates—Gilbertson's Old Method and Camaret.

We are requested by Robert B. Hugunin, Hartford, Conn., to inform the trade that all genuine Improved Hugunin Adjustable Sash Balances and Sash Locks have "Robt. B. Hugunin, Patentee and Solely Authorized Maker," cast directly upon their face-plates. He intimates that all others should be rejected as imitations of his goods, and that, as he has no agent in New York City, all orders and inquiries should be sent directly to him at Hartford, Conn.

Bruce & Cook, of this city, have issued to the trade their annual office calendar, accompanied by a circular of New Year greetings, from which we quote as follows:

With much the largest portion of our friends the year past has been one more

free from business perplexities than several of the previous ones. The general impression of the end of the long night of depression, and the more hopeful aspect of industrial enterprises, have given tone and stability to our markets that have long been wanting. In our opinion nothing but the fear of demoralization of the currency, from the continued coinage of silver, prevents the enterprise that would speedily supply work and wages to all willing and skillful hands. We look hopefully to Congress promptly to relieve the business interests of the country from this danger: this done, we shall confidently anticipate for you and ourselves a year of prosperity for all legitimate and prudent enterprises.

We are advised that the Union Hardware Co., of Torrington, Conn., have entered into an arrangement with Tower & Lyon, of 96 Chambers street, New York, whereby Tower & Lyon will represent them direct to the trade in the marketing of their goods, and also take charge of their New York office, which remains temporarily at 75 Chambers street, but will be removed February 1 next, to Tower & Lyon's headquarters at 96 Chambers street. We understand that Tower & Lyon have become stockholders in the Union Hardware Co., and the friends of both concerns will receive the announcement of this arrangement with satisfaction, as one promising well for both these well known and enterprising houses.

The readers will observe that J. B. Shannon & Sons, 1020 Market street, Philadelphia, in their announcement on page 38, illustrate one of their styles of Polished Brass Railing for offices and banks. Other patterns are displayed in their illustrated catalogue.

The Lansing Wheelbarrow Co., Lansing, Mich., have appointed S. A. Haines & Co., 90 Chambers street, sole agents (except as regards the city of Chicago) for the sale of their Wheelbarrows, Hand Carts, Trucks, &c., on which goods they are authorized to make the manufacturers' most favorable terms. The different styles they manufacture, and the special features which characterize them, are illustrated in their catalogue.

The Reed Mfg. Co., Canajoharie, N. Y., have also appointed S. A. Haines & Co., 90 Chambers street, sole agents for the sale of their goods. Their line covers, it will be remembered, Reed's Steel Arm Barn Door Hangers for either steel or wood track, Reed's Patent Gravity Gate Latch, Wrought-Iron Hinges, &c., Reed's Patent Self-Lubricating Pulley and Tackle Blocks, &c. These goods, which have been favorably received by the trade, and are recognized as having merit, are illustrated in their circular. S. A. Haines & Co. are authorized to give the company's best terms, and attention is called to the favorable prices at which the goods may be purchased.

The Nashua Lock Co., 36 Pearl street, Boston, and 148 Lake street, Chicago, are about to issue a circular to the trade advising them that a new catalogue and price list is in preparation, which they hope to distribute to their patrons next month. In the meantime they state that they will adopt as their list prices and discounts those made by the Association of Lock Makers for goods corresponding with theirs in quality.

There is a good deal of activity on the part of the different manufacturers of Lawn Mowers in presenting their goods to the trade, and the prospect is that the coming season will be satisfactory, at least in the quantity of machines sold.

We are in receipt of an effective circular or poster illustrating the New Easy Lawn Mower made by the Blair Mfg. Co., Springfield, Mass. It shows the different styles in which the Mower is made, and the advantages claimed for it in different uses.

Concerning the destruction of the forge shop and rolling mill of the E. D. Clapp Mfg. Co., Auburn, N. Y., on the night of January 3, of which our readers will learn with regret, the company have issued the following circular to their customers, under date January 4:

We regret to inform you that our rolling mill and one of our forge shops were last night completely destroyed by fire. While our loss is heavy and we shall necessarily be inconvenienced by the loss of a large portion of our forging capacity, yet, having remaining all of our finishing machinery, and at least one-half our drop hammers, together with a large stock of finished goods, we shall be able to continue our business as usual, and by putting on a double force of men and by running our No. 1 Forging Shop day and night, shall be able to execute orders with our usual promptness.

The Standard Tool Co., Cleveland, Ohio, manufacturers of Straight Lip Increase Twist Drills and special tools, issue, with the acknowledgment of past favors, their new catalogue, in which they describe, with illustrations and list prices, the goods of their manufacture, to the quality of which and their facilities for producing them they allude. They direct special attention to their Screw Driver Bits and Machinists' Screw Driver as new tools which mechanics will appreciate, referring to them as handy and indestructible and made of the best material. They also refer specially to their Reamers as made and ground by the Pratt & Whitney new process, which they describe as giving them an exactness of size and a cutting edge superior to the ordinary Reamer.

Pekin, in the far North of China, is now connected by a direct telegraph line through Canton with Lungchow, on the frontier of Touquin, the extension from Canton to the latter place being made during the recent war, purely for military purposes. This great line, stretching through the Chinese Empire from North to South, is to be supplemented by a line along the Southern borders of China.

Caliper with Sliding Nut. These articles, as well as his Iron Level, are shown in his advertisement on page 44.

The Bryan Mfg. Co., Bryan, Ohio, issue a catalogue and circular relating to their line of Champion Bolted Wheelbarrows, of the different styles of which they give illustrations. They allude especially to their Iron Center Wheel as a new article, to the merits and selling qualities of which they refer.



ILLINOIS IRON & BOLT CO.,

Nos. 20 to 26 Main Street,
CARPENTERSVILLE, KANE CO., ILL.,
MANUFACTURERS OF

BLACKSMITHS' TOOLS,



PATENT STEEL WAGON SKEINS,

Jack Screws, Tire Benders, Track Jacks,
Carriage Makers' Vises,

SAD IRONS, COPYING PRESSES AND STANDS, &c.



BRASS AND IRON SHIP CHANDLERY HARDWARE.
Yacht Fixtures, Nickel-Plated Canoe Trimmings, Cheapest and Best Side Lights in the Market, Awning Hardware. Specialties in Brass made to Order.
THE SHELTON BRASS HARDWARE CO., Birmingham, Conn.
Send for Illustrated Catalogue.
NEW YORK WAREROOMS: 95 Chambers St. CHICAGO WAREROOMS: 177 Lake St.



Has No Equal,

Surpassing All Others,

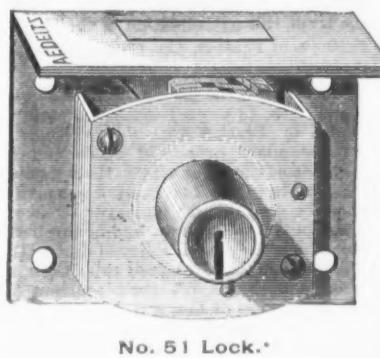
AND PRONOUNCED

"THE BEST."

Illustrated Price lists sent upon application.
Please write for same to

LLOYD & SUPPLY HARDWARE CO., Phila.
DURRIE & McCARTY, New York.
AMER. PLOW CO., Boston, Mass.
PRATT & CO., Buffalo, N. Y.
SHELDON & RICHARDSON, St. Louis, Mo.
HAMILTON & MATHEWS, Rochester, N. Y.
MARKLEY, ALLING & CO., Chicago, Ill.
LOGAN, GREGG & CO., Pittsburgh, Pa.
JANSEN, SEIFERT & CO., Minneapolis, Minn.
HUTTINGTON, HOPKINS & CO., San Francisco, and
Sacramento, Cal.
FOSTER, STEVENS & CO., Grand Rapids, Mich.
GEO. TRITCH HWY. CO., Denver, Col.
MATHEWS, CASE & CO., Los Angeles, Cal.
ANDREW TREADWAY & SONS, Dubuque, Iowa.

A. E. DEITZ.

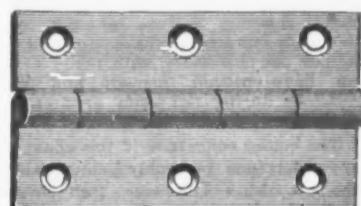


No. 51 Lock.

DURRIE & McCARTY, Agents,

97 Chambers and 81 Reade Sts.,

NEW YORK.



W. & J. TIEBOUT,

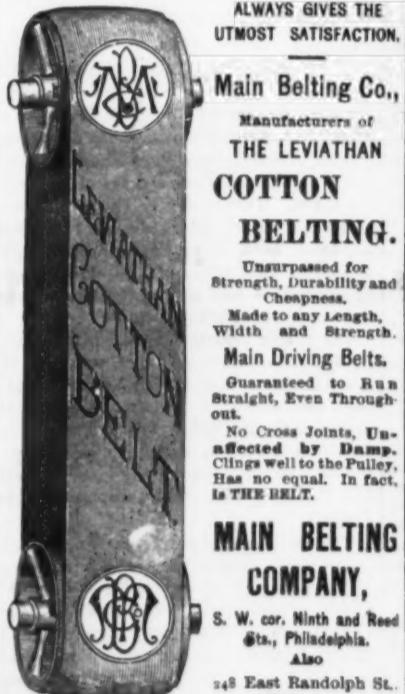
MANUFACTURERS OF

BRASS, GALVANIZED & SHIP CHANDLERY

HARDWARE.

Nos. 16 & 18 Chambers Street,

NEW YORK.



ALWAYS GIVES THE
UTMOST SATISFACTION.

Main Belting Co.,

Manufacturers of
THE LEVIATHAN

COTTON

BELTING.

Unsurpassed for
Strength, Durability and
Cheapness.

Made to any Length,
Width and Strength.

Main Driving Belts.

Guaranteed to Run
Straight, Even Through-out.

No Cross Joints, Un-
affected by Damp.
Cling well to the Pulley.
None equal. In fact,
is THE BELT.

MAIN BELTING

COMPANY,

S. W. cor. Ninth and Reed
Sts., Philadelphia.

Also
248 East Randolph St.
CHICAGO.



BRYANT'S PATENT
EGG BEATERS.

SIMPLE, PRACTICAL,
NOVEL.

Retails at 20 Cents Each.

Price, \$2.00 per doz. and dis.

ADDRESS MANUFACTURERS,

PAINE, DIEHL & CO.,

12 BANK STREET,
Philadelphia, Pa.



AETNA POWDER CO.
HIGH EXPLOSIVE CO.

The Strongest
And
Safest.

DYNAMITE
FOR ALL KINDS OF BLASTING.

CAPS, FUSE
AND ALL

BLASTING SUPPLIES.

Write for Illustrated Pamphlet. Mailed free.

AGENTS WANTED.

AETNA POWDER CO.,

98 Lake St., Chicago.

SEELEY, CHURCH & COMPANY,

PACIFIC COAST AGENTS

FOR EASTERN MANUFACTURERS

IRON, STEEL, HARDWARE, &c.

Correspondence solicited.

No. 909 California St. (Rooms 6 and 7), San Francisco, Cal.

WE HAVE ADDED THE GOODELL LATHE AND SAW,

As seen in this Cut, to our Line of SCROLL SAW SUPPLIES for the coming year.

It is by far the best Lathe in market. We have also made great improvements on the

Lester, Rogers and Cricket Saws.

Another generation of boys is coming to the front, so that the demand for these Saws is fast increasing, and seems likely to be as large as it was eight years ago. Dealers can increase their fall trade by laying in a stock.

Goodell Lathe and Tools.....\$10.00.
Scroll Saw Attachm't, extra 2.00.
Lester Saw and Lathe.....10.00.
Rogers Saw No. 1.....3.50.
Cricket Saw, all Iron.....2.50.
Bracket Sets, Nickel Plated,
per doz.....15.00.
Bracket Sets, Pleasure and
Profit, per doz.....10.00.

We are headquarters in New York for Wood, Designs and supplies of all kinds for bracket saws. Our Star Bracket Blades are superior to any others in use, and are in demand in many other countries.

There is a regular trade discount to all dealers.

MILLERS FALLS CO.,
74 CHAMBERS STREET, NEW YORK.



H. B. SEIDEL,

President.

W. HASTINGS,
Vice-Pres. and Gen'l Mgr.

E. T. CANBY,
Sec. and Treas.

THE SEIDEL & HASTINGS CO.

WILMINGTON, DELAWARE,

New York Office, No. 221 Pearl, Corner Platt Street.

MANUFACTURERS OF

BEST CHARCOAL
BOILER PLATES,
AND PLATE IRON GENERALLY.

ALSO BEST QUALITY HOMOGENEOUS STEEL PLATES.

We ask the special attention of the trade to our C. H. No. 1 Boiler Plates, which we manufacture especially for the Shells of Steam Boilers and stamp 50,000 pounds T. S. when desired. The hundred and sixteen plates of this iron, made during the last three years by the U. S. Inspectors of Steam Vessels, show an average tensile strength of 55,800 pounds to the sectional square inch, and an average reduction of area of the fractured section of 30% per centum. Our prices are as low as the production of a good article will admit of.



ALFRED C. REX & CO.,
Manufacturers of
PATENTED HARDWARE SPECIALTIES AND NOVELTIES.

MAIN OFFICE AND FACTORY
FRANKFORD, PHILA.

BRANCH OFFICES:
126 Chambers St., New York, Chas. E. Spier, Mgr.

and 415 Commerce St., Phila.

New Spring Specialties—King Egg Beaters, awarded medal at American Institute, New York; King Candle Lamp and Lantern, cheapest combination ever made.



ALL STEEL CASE-HARDENED JAWS, WARRANTED. MANUFACTURED BY
OWSLEY BROS. & MARBLE, 784 to 794 Madison St., CHICAGO, U. S. A.

Description and Price List Furnished upon Application.

PURE TURKISH EMERY.

WALPOLE EMERY MILLS,
South Walpole, Mass.

DANVILLE NAIL & MANUFACTURING CO.,

Danville, Pa.



Common,
Fencing,
Clinch,
Flooring,
Car,
Boat,
Finishing,
Box,
Fine Finishing,
Casing,
Slating,
Roofing,
Barrel,
Cement,
Tobacco,
Lining,
Brads,
And Cut Spikes,
Or any
Special
Size or
Pattern of
Cut Nails
Or Cut Spikes.



SALES AGENTS:

BORDEN & LOVELL,

70 and 71 West Street,
NEW YORK.

CORNING & CO.,

ALBANY, N. Y.

ESHERICK & CO.,

263 South 4th Street,
PHILADEPHIA.

H. D. & S. J. WATERMAN,

612 North 3d Street,
ST. LOUIS, MO.

WM. F. MANSEN,

GALVESTON, TEXAS.



DANVILLE NAIL WORKS.

LOCATED ON

Penna. Railroad, Phila. & Reading Railroad, and Delaware, Lackawanna & Western Railroad.

These three roads to all important points give us unequalled Shipping facilities,
enabling us to guarantee *prompt shipment and quick delivery.*

DANVILLE NAIL WORKS.

The most important and best equipped Establishment
for making Nails.

This factory was the first to adopt and successfully operate the REGENERATIVE GAS FURNACES,
twenty-five of which have lately been constructed in the Factories in and about Wheeling.

WHOLESALE METAL PRICES, January 6, 1886.

METALS.

IRON.—Duty: Bars, 8-10¢ to 11-10¢ $\frac{1}{2}$ lb.; provided that no Bar Iron shall pay a less rate of duty than 35¢. Sheet, 11-16¢ to 15-16¢ $\frac{1}{2}$ lb. Band, Hoop and Scroll, 1¢ to 1-4¢ $\frac{1}{2}$ lb. Railroad Bars weighing more than 25 lb. $\frac{1}{2}$ yard, 7-10¢ $\frac{1}{2}$ lb.

Standard American Pig Iron.

Foundry No. 1 X. $\frac{1}{2}$ ton \$18.00 @ 18.50
Foundry No. 2 X. $\frac{1}{2}$ ton 17.00 @ 17.50
Gray Forge. $\frac{1}{2}$ ton 16.00 @ 16.50

No. 1 Scotch Pig Iron.

Carmbroe. $\frac{1}{2}$ ton 20.50 @ 21.00
Coltness. $\frac{1}{2}$ ton 20.00 @ 20.50
Shotts. $\frac{1}{2}$ ton 19.50 @ 20.00
Gartsherrie. $\frac{1}{2}$ ton 20.50 @ 20.50
Langloan. $\frac{1}{2}$ ton 19.50 @ 20.00
Summerlee. $\frac{1}{2}$ ton 19.50 @ 20.00
Dalmellington. $\frac{1}{2}$ ton 18.00 @ 18.50
Ecclestone. $\frac{1}{2}$ ton 18.00 @ 18.50
Clyde. $\frac{1}{2}$ ton 18.50 @ 19.00

Rails.

Steel, at Eastern mills. $\frac{1}{2}$ ton \$34.00 @ 34.50
Old Rails, T. $\frac{1}{2}$ ton \$20.00 @ 21.00

Scots.

Wrought, $\frac{1}{2}$ ton from yard. 19.00 @ 20.00
Pig Iron from Store.

Common Iron: $\frac{1}{2}$ to 1 in. round and square. $\frac{1}{2}$ lb. 1.65 @ 1.75¢
1 to 6 in. x $\frac{1}{2}$ in. $\frac{1}{2}$ lb. 1.9 @ 2.0¢

Refined Iron: $\frac{1}{2}$ to 2 in. round and square. $\frac{1}{2}$ lb. 1.85 @ 2.0¢
1 to 6 in. x $\frac{1}{2}$ to 1 in. $\frac{1}{2}$ lb. 1.9 @ 2.0¢

Rods— $\frac{1}{2}$ in. and 1-16 round and sq. $\frac{1}{2}$ lb. 1.7 @ 2.0¢
Bands—1 to 62 in. to No. 12. $\frac{1}{2}$ lb. 2 @ 2.0¢
Burden's Best Iron, base price. $\frac{1}{2}$ lb. 2.0¢
Burden's H. B. & S. Iron, base price. $\frac{1}{2}$ lb. 2.5¢
Norway Nail Rods. $\frac{1}{2}$ lb. 2.0¢

Sheet Iron from Store.

Common. R. G.
American. Cleaned.
Nos. 10 to 16. $\frac{1}{2}$ lb. 2.70 @ 3¢ 3½¢
17 to 20. $\frac{1}{2}$ lb. 3 @ 3½¢
21 to 24. $\frac{1}{2}$ lb. 3 @ 3½¢
25 and 26. $\frac{1}{2}$ lb. 3.12½ @ 3½¢
27. $\frac{1}{2}$ lb. 3.25 @ 3½¢
28. $\frac{1}{2}$ lb. 3.37½ @ 3½¢ 3.50 @ 4¢
B. B. 2d qual.

Galvanized, 10 to 20. $\frac{1}{2}$ lb. 3 @ 3½¢
Galvanized, 21 to 24. $\frac{1}{2}$ lb. 3½¢ 5¢
Galvanized, 25 to 30. $\frac{1}{2}$ lb. 6 @ 6½¢
Galvanized, 37. $\frac{1}{2}$ lb. 6 @ 6½¢
American Russia. $\frac{1}{2}$ lb. A, 10 @ 10¢
Russia. $\frac{1}{2}$ lb. 10 @ 10½¢
American Cold Rolled B. B. $\frac{1}{2}$ lb. 5 @ 5½¢ 7¢

Iron Wire.—(See Wire.)

STEEL.—DUTY: Ingots, Bars, Sheets, &c., valued at 4¢ $\frac{1}{2}$ lb. or less, 45¢ ad. val.; valued above 4¢ and not above 7¢ $\frac{1}{2}$ lb., 2¢ $\frac{1}{2}$ lb.; valued above 7¢ and not above 10¢ $\frac{1}{2}$ lb., 3¢ $\frac{1}{2}$ lb.; valued above 10¢ $\frac{1}{2}$ lb., 3½¢ $\frac{1}{2}$ lb. **Extra.**—Steel Bars, Rods, &c., cold hammered or polished, in any way in addition to ordinary hot rolling, 1¢ $\frac{1}{2}$ lb. in addition to above; Steel Circular Saw Plates, 1¢ $\frac{1}{2}$ lb. in addition to the above.

American Cast Steel. For American Steel, see Pittsburgh quotations.

Chrome Steel. Too Steel, ordinary sizes, $\frac{1}{2}$ to 3 inches, not. 10 @ 14¢
Adamantine Shoes and Dies. 8 @ 8¢
Magnet Steel. 14 @ 12¢

English Steel.

Best Cast. $\frac{1}{2}$ lb. 15 @ 17¢
Extra Cast. $\frac{1}{2}$ lb. 16 @ 17¢
Circles, Plates, &c. $\frac{1}{2}$ lb. 14 @ 17¢
Round Machinery, Cast. $\frac{1}{2}$ lb. 10 @ 12¢
Swaged, Cast. $\frac{1}{2}$ lb. 16 @ 17¢
Best Double Shear. $\frac{1}{2}$ lb. 15 @ 17¢
Blister, 1st quality. $\frac{1}{2}$ lb. 14 @ 17¢
German Steel, Best. $\frac{1}{2}$ lb. 15 @ 17¢
2d quality. $\frac{1}{2}$ lb. 14 @ 17¢
3d quality. $\frac{1}{2}$ lb. 13 @ 16¢
Sheet Cast Steel, 1st quality. $\frac{1}{2}$ lb. 14 @ 17¢
2d quality. $\frac{1}{2}$ lb. 13 @ 16¢
3d quality. $\frac{1}{2}$ lb. 12 @ 15¢

TIN.—DUTY: Plates, Sheets, Tagger and Terne, $\frac{1}{2}$ lb. $\frac{1}{2}$ lb.; Bars, Block and Pipe from 10¢ to 12¢.

Bar. $\frac{1}{2}$ lb. 22 @ 22½¢
Straps. $\frac{1}{2}$ lb. 21 @ 22½¢
English. $\frac{1}{2}$ lb. 21½ @ 22½¢

Charcoal Tin Plates.

I C 10x14 225 sheets. $\frac{1}{2}$ box \$3.25 @ 7.25
I C 12x14 225 sheets. $\frac{1}{2}$ box 3.25 @ 7.25
I C 10x14 225 sheets. $\frac{1}{2}$ box 10.50 @ 14.50
I C 12x14 225 sheets. $\frac{1}{2}$ box 12.25 @ 14.50
I C 12x12 225 sheets. $\frac{1}{2}$ box 12.25 @ 9.00
I C 14x30, 112. $\frac{1}{2}$ box 6.25 @ 9.25
I C 14x30, 112. $\frac{1}{2}$ box 6.25 @ 9.25
I C 12x14 17.100. $\frac{1}{2}$ box 5.00 @ 5.50
I C 12x14 17.100. $\frac{1}{2}$ box 6.25 @ 7.00
For each additional X add. 1.25 @ 2.00

Coke Tin Plates. Best. Ordinary

I C 10x14. \$4.75 @ 4.75¢
I C 12x12. 4.87½ @ 4.75¢
I C 12x12, gutters, 225 sheets. 8.00 @ 7.25
I C 30x36, 112 sheets. 10.25

Tin Plates. Prime Char. 2d. quality. $\frac{1}{2}$ lb.

I C 14x20M. F. \$6.87½ @ 7.12½¢
I C 14x20 Old Process. 8.07½

I C 20x28. 14.00

I C 14x20. 4.75 @ 4.87½

I X 14x20. 6.25 @ 6.25

I C 30x28. 9.25 @ 9.25

I X 14x20. 12.75 @ 14.50

I C 30x36. 18.50 @ 12...

Tin Boiler Plates.

XXX 14x26, 2 sheets for No. 7, 112 sheets. \$12.00

XXX 14x28, 2 sheets for No. 8, 12.00

XXX 14x31, 2 sheets for No. 9, 15.00

COPPER.—DUTY: Pig, Bar and Ingots, 4¢ $\frac{1}{2}$ lb. Old Copper, 3¢ $\frac{1}{2}$ lb. Manufactured (including all articles of which Copper is a component) of chief value, 35¢ ad valorem.

Tinot, Lake. $\frac{1}{2}$ lb. 11½¢ @ 12¢

Ingot, Baltimore. 11 @ 11½¢

Tinot Anchor. 11½ @ 11½¢

Braziers' Copper, ordinary sizes, 10 oz. $\frac{1}{2}$ sq. in. and over. 17 @ 17¢

Braziers' Copper, ordinary sizes, under 10 oz. and over 12 oz. $\frac{1}{2}$ sq. in. 19 @ 19¢

Braziers' Copper, 10 oz. and 12 oz. $\frac{1}{2}$ sq. in. 21 @ 21¢

Lighter than 10 oz. $\frac{1}{2}$ sq. ft. 23 @ 23¢

Circles less than 84 in. in diam. 24 @ 24¢

84 in. diam. and over. 26 @ 26¢

Segments and Pattern Sheets. 27 @ 27¢

Locomotive Fire-Box Sheets. 28 @ 28¢

Sheeting Copper, over 12 oz. $\frac{1}{2}$ sq. in. 29 @ 29¢

Bolt Copper. 30 @ 30¢

Copper Bottoms. 30 @ 30¢

Nickel Plated Sheathing. 30 @ 30¢

for boilers

Plating extra. 32 @ 32¢

Flat Copper Boiler Bottoms or Pit Bottoms, cut to special sizes. 32 @ 32¢

Thinner.

4x48, by the case. $\frac{1}{2}$ sheet \$1.00

1x48, less than case. 8¢

For tinning both sides, double the above amount.

O'Neill's Patent Planished Copper. Net. 1x48

14 and 16 oz. and heavier. By the case. $\frac{1}{2}$ lb.

12 oz. and lighter. $\frac{1}{2}$ lb. 12.50 @ 12.50¢

B. B. 14x26. 12.50 @ 12.50¢

7 in. 14x26, 8 in. 14x26, 9 in. 14x26.

14 and 16 oz. and heavier. By the case. $\frac{1}{2}$ lb.

(And all sizes not over 20 in. wide.) 24x48 and 30x60.

4 and 16 oz. and heavier. $\frac{1}{2}$ lb. 34¢

12 oz. 37¢

Copper Wire.—(See Wire.)

Sheathing Metal.

Yellow Sheathing Metal. 18¢ @ 18¢

BRASS AND GERMAN SILVER.

Brown & Sharpe's Gauge the Standard for Metal;

Old English Gauge the Standard for Wire;

Brass Manufacturers' Price List, January 17, 1884. $\frac{1}{2}$ lb. 30 @ 30¢

LEAD.—DUTY: Pig, \$2 $\frac{1}{2}$ lb.; Old Lead, 2¢ $\frac{1}{2}$ lb.; Pipe and Sheet, 3¢ $\frac{1}{2}$ lb.

American. 4.80 @ 5¢

Pipe. 5½¢ @ 5½¢

Pipe. 6½¢ @ 6½¢

Block Tin Pipe. 40¢
Tin Lined Pipe. 15¢, dis. 20¢
Sheet. 7½¢, dis. 20¢
Shot, 3 lb. Drop, \$1.85; Buck, \$1.60
Chisel, Shot, 3 lb. 1.60

Hallett's. 2 lb. 9 @ 9¢ @ 9¢

Cookson. 9¢ @ 10¢ $\frac{1}{2}$ lb.

W. 100 lbs. 1.60

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INDUSTRIAL ITEMS.

NEW YORK.

The employees of both of the glass works at Ithaca have received orders from President Clive, of the National Glass Blowers' Association, to discontinue work, and as a result both factories have closed down. One hundred and fifty men are thrown out of employment.

The Millerton Iron Co., Millerton, Dutchess County, N. Y., in a circular, under date of January 1, say: "The opening of the year 1886 finds our new blast furnaces nearly completed, and we expect in a few days to be able to fill all orders from our old customers and from others who may favor us. The destruction of our plant by fire in May last caused us to decide upon the erection of an entirely new structure, with increased facilities, and into it we have incorporated all appliances and improvements which, while decreasing the cost of manufacture, would insure a uniform character to our product."

Otis Brothers & Co. have been awarded the contract for the hoisting engine at Shaft No. 14 of the new aqueduct. It will have their special safety attachments and be operated by a hand rope the same as in elevator duty.

PENNSYLVANIA.

At the Hartman Nail Wire Works, Beaver Falls, there were turned out in the 24 hours run on one day 167 kgs of wire nails. This was the largest output ever made there, and the management gave the men gratuities in consideration of it.

The Mount Hickory Furnaces, at Sharpsville, bought some time since by Hon. W. L. Scott, of Erie, are to be put in blast at once, under the management of A. M. and Josiah Robbins, who formerly managed the Roseau Furnace, at New Castle.

Douglass Furnace, of Pierce, Kelly & Co., at Sharpsville, made one of the quickest repairs on record. Twenty-four days from the time the lining fell in it had been relined and is again in blast.

Or, Painter & Co., of the Reading Stove Works, have shipped over 2000 stoves to Chicago during the past two seasons.

The 10 per cent. reduction in the wages of the nailers at the works of the E. & G. Brooke Iron Co., at Birdsboro, went into effect on the 1st inst.

The Enterprise Colliery, at Excelsior, operated by Charles Baumgardner & Co., of Lancaster and Philadelphia, suspended work pending the settlement of a suit brought by Mine Inspector Ryan. Four hundred men are thrown out of employment.

Northampton Furnace (anthracite), in the Lehigh Valley, will blow in soon.

Howard Furnace (charcoal) will not blow in this year.

Mabel Furnace, Sharpsville, made 2480 gross tons of iron in December.

Katherine Furnace (anthracite), in the Lower Susquehanna Valley, blew in on the 3d inst.

Stack No. 5 of the Allentown Iron Co.'s furnaces has been working badly of late, and it is feared the furnace will have to be blown out for repairs.

It is said that parties have been examining the Rodman Furnace property, at Roaring Springs, with a view of putting the furnaces in operation.

PITTSBURGH AND VICINITY.

The laborers at the Lucy Furnace, Pittsburgh, have had their wages increased.

The firm of Robinson, Rea & Co., founders and machine builders, of Pittsburgh, has been dissolved and is succeeded by the Robinson-Rea Mfg. Co., a chartered corporation.

The Linden Steel Co., Limited, Pittsburgh, have purchased a shear which has knife that will cut at one stroke a plate $1\frac{1}{4}$ to $1\frac{1}{2}$ inches thick and 110 inches wide,

Mr. James Morrison, of Belle Vernon, a gentleman interested in the glass industry there, was in McKeesport last week looking after a site for a glass works, the erection of which will cost \$30,000, and almost twice that sum to be put in successful operation. It is proposed to manufacture colored window-glass of a fine quality.

Mariand, Neely & Co., nut manufacturers, Southside, are making extensive additions to their works and intend to largely increase their force of men. Natural gas has been put in all the furnaces and the works will run double turn in all departments.

Cunningham & Ihmson's glass factory, on the Southside, which has been idle for some time, started up on Monday last with 40 bottle-blowers.

A new tack factory is to be erected on the Southside. About 150 machines with the latest improvements will be put in, and employment will be given to 400 hands. A substantial building will be put up immediately, and it is expected that the manufacture of tacks will be begun at least by the 1st of July.

A large amount of extra heavy bridge iron has just been completed at Wilson, Walker & Co.'s Union Iron Mills. It is for a bridge which is to span the Mississippi River at St. Paul, and which, when completed, will be probably the finest bridge structure in the world. It will be 700 feet from the water, and 1560 feet in length. The longest span will be 350 feet in length, and the amount of iron and steel required in its construction will be 3000 tons.

The Westinghouse Electric Co. last week applied for a charter for the purpose of selling and dealing in machinery and appliances for the generation, transmission and utilization of electricity. The capital stock is \$1,000,000. Geo. Westinghouse, Jr., of Pittsburgh, owns 193,000 shares.

OHIO.

The representatives of the American Flint Glass Workers' Union and the managers of the Buckeye and La Belle glass works, at

Martins Ferry, have arrived at an understanding, and those two factories, which have been idle for 13 months, will resume operations at once.

Bloom Furnace (charcoal), in the Hanging Rock region, will blow in soon.

The Grafton Iron Co., at Leetonia, will blow in one of their furnaces about the 11th inst.

A co-operative nail works is to be established at Wellston, Jackson County, with a capital of \$150,000. It is expected that the factory will be in operation by May 1.

The report that the Coshocton Iron and Steel Works have been closed indefinitely on account of not being able to compete at the prevailing prices is entirely false. The works are running full time.

Anna Furnace (coke), in the Mahoning Valley, will blow in a few days.

One stack of Hazelton Furnace and one of Hinrod, in the Mahoning Valley, will blow in soon.

Thomas Furnace, at Niles, blew in a few days ago.

Sarah Furnace, in the Hanging Rock region, will blow in about February 1.

Star Furnace, in the Hanging Rock region, will blow in this month.

The American Nail Machine Co., Ashtabula, report business in their line good. They have just closed a contract with the Pacific Iron and Nail Co., San Francisco, Cal., for a large number of their improved cut-nail machines, and have several contracts pending.

ILLINOIS.

A Chicago drill company has been awarded the State contract to bore an experimental well, 2000 feet in depth, in the salt basin of Nebraska, the purpose being to test the amount and quality of the brine.

The Van Depoele Electric Railway Motor Co., of Chicago, have been incorporated by Lucius Clark, Wm. A. Stiles, and John Easau. The capital stock is \$500,000.

There was a change in the management of the Calumet Iron and Steel Co., Chicago. Mr. Daniel P. Eels, of Cleveland, has assumed the presidency of the company, Mr. Cummings and Mr. Bradley retiring from active management. The nail department of these works is in partial operation.

The brass shop of the Crane Brothers Mfg. Co., Chicago, is being enlarged.

John Mohr & Son, Chicago, have secured a contract from the Joliet Steel Co. for boiler work requiring 180 tons of steel for its completion. The works are pushed to their utmost in getting out orders.

MICHIGAN.

The Huyett & Smith Mfg. Co., of Detroit, have issued a special notice announcing that the embarrassment of M. C. Huyett & Co. in no way affects the entirely separate and distinct corporation of the Huyett & Smith Mfg. Co., established under the laws of Michigan. Mr. Huyett sold his stock in the company two years ago, and since then has had no interest in it whatever. Mr. D. M. Ferry, president of the D. M. Ferry Seed Co., has since been president of the Huyett & Smith Mfg. Co., which, under his direction, have largely extended their business and reputation for manufacturing the celebrated Smith power-saving blowers, exhaust fans, ventilators, lumber dryers and seed-cotton elevators.

MISSOURI.

A new departure is promised by the Missouri Furnace when they start up their second furnace about the 1st of March—the production of ferromanganese from the manganiferous ores to be found near Batesville, Ark. The company are now refining their furnace and getting it in readiness to use these ores a couple of months hence provided the branch railroad at present building in the direction of the ore beds is completed by that time; otherwise they will make a start on Bessemer iron and change to manganese as soon as the ores can be reached.

KENTUCKY.

F. F. Gilmore, formerly connected with Geo. S. Moore as salesman, has established a brokerage business at 176 Second street, Louisville, in pig iron, coke, old material, nails, spikes and merchant iron, steel and tinner's stock.

MARYLAND.

Ashland Furnace (anthracite), now in blast, is rented by the Pennsylvania Steel Co., at Steelton, Pa., and is turning out Bessemer iron.

Muirkirk Furnace (charcoal) blew in this week to use up stock.

GEORGIA.

Rising Fawn Furnace, the property of the Walker Coal and Iron Co., is now turning out 120 gross tons of pig iron daily.

ALABAMA.

The Brierfield Coal and Iron Co., of Brierfield, are making about 600 kgs of nails per day at their factory. Bible Furnace, the property of the above company, is being remodeled for the use of coke, and will go into blast about the 1st of July.

The firm of Stevens & Fenton, of Birmingham, have been dissolved, Mr. Fenton retiring. A company have been organized with E. G. Stevens as president, which will be known as the Birmingham Fire Brick Works. The paid-in capital is said to be \$50,000.

The Birmingham Chain Works have just commenced operations.

The Edgton Land Co. have sent North for engines to pull their street cars.

COLORADO.

The following report by the Colorado Coal and Iron Co. gives the production for the year 1885:

Iron and Steel Departments.

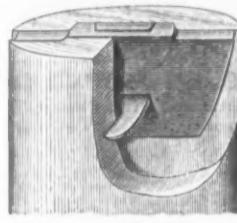
Pig iron	5,480 net tons.
Iron castings	856 net tons.
Cast-iron water-pipe	629 net tons.
Merchant bar, mine rail, &c.	1,810 net tons.
Steel rails	2,048 gross tons.
Nails	64,100 kgs.
Spikes	1,500 kgs.

Coal and Coke Departments.

Hardware Novelties.

LOCK WEDGE.

C. J. Grellner, 1105 Biddle street, St. Louis, Mo., is the patentee and manufacturer of the lock wedge illustrated herewith. Fig. 1 shows the wedge locked in a handle, and Fig. 2 the two pieces composing the wedge. The wedge proper is made of cast iron and has a shallow slot at one side, at the bottom of which is a hole extending through the wedge. The lower side of the hole is sharply beveled and forms the end of the slot. The lock piece shown in Fig. 2 is of soft iron beveled at the smaller end. The wedge is inserted in the handle in the usual



Lock Wedge.—Fig. 1.—Showing Wedge in Handle.

manner, after which the lock piece is driven into the slot referred to above. When the lock piece reaches the bottom of the slot its beveled end following the lower side of the hole, which is also beveled, is turned aside and penetrates the wood of the handle, its final position being as indicated in Fig. 1. The lock wedge, it will be readily under-



Fig. 2.—Detailed View of Wedge and Lock Piece.

stood, is thus securely held in position and cannot fly out unless the lock piece is withdrawn. As the lock piece, however, is bent in the wood, it cannot be loosened accidentally, but must continue to hold the wedge in position as long as the handle remains intact. The simplicity of this wedge will be recognized, and the security with which it is held in place.

IMPROVEMENTS IN PLANES.

The Stanley Rule and Level Co. have recently brought out several new specialties that are of interest to our readers. Four of



Fig. 1.—Adjustable Chamfer Plane.

these are shown in the accompanying illustrations. Fig. 1 represents a chamfer plane in which the cutter is attached to a section of the plane that is adjustable up and down. It is so arranged as to be firmly secured to the rear section at any desired point by means of a thumb-screw.

Fig. 2 represents a rebate plane with an iron stock and depth gauge.

Fig. 3 represents a scraping and finishing plane.

Fig. 4 represents a floor plane.

Fig. 5 represents a combination gauge.

veneers. The features of the tool are clearly shown in the engraving, so that a description is scarcely necessary. By inserting a toothed plane iron, a smooth surface can be corrugated uniformly, and thus made ready for glueing. The fourth illustration represents a floor plane. The planing of floors, which is very commonly required in modern work, involves perhaps more backache and hard knee service than any other work required of carpenters. The tool here illustrated has been devised to relieve the mechanic in this respect. The length of the plane is $10\frac{1}{2}$ inches, the width of the cutter is $2\frac{1}{8}$ inches, and the plane is heavy, weighing about 10 pounds. The handle is 45 inches long, and the two grips

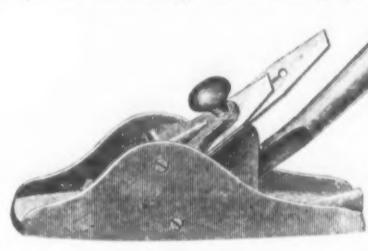


Fig. 4.—Floor Plane.

can be adjusted to suit the requirements of the individual operator. For planing floors for such purposes as bowling alleys, skating rinks, decks of vessels, &c., this tool will be found very useful. The makers assert that more work can be done with it, and with less outlay of strength, than with any other article now in the market. These tools are manufactured by the Stanley Rule and Level Co., New Britain, Conn., and No. 29 Chamber street, New York.

COMBINATION GAUGE.

We show below a combination gauge that has recently been put upon the market by Otis A. Smith, of Rockfall, Conn. It may be described as a 20-inch panel and marking gauge, the first term indicating its capacity and the latter term the uses to which it may be applied. The gauge is of metal, the bar being of hollow tubing, the sections joined by a threaded portion, as indicated in the center of the engraving. In the specimen which has been submitted for our inspection the joint is very neatly made, insuring the free passage of the cross-arm. Should a longer gauge for any reason be required, the tool could be lengthened by using additional sections of tubing combined in the same manner. The gauge being made of metal, as we have described, is likely to be far more durable than wooden gauges which it is intended to supersede, and at the same

time it is lighter than wooden gauges. The sections of which it is composed are approximately 10 inches in length, and the gauge when taken apart packs up in a very small compass. Among the advantages to which the maker directs attention is that, the bar being round, the gauge can be set in any position necessary for making either a deep or shallow cut with the spur. The spur is adjustable by means of screws entering the end of the rod. Provision is also made at one end of the bar for inserting a pencil for marking parallels or for inscribing circles. At the opposite end of the bar a small marking gauge may be attached, thus adapting the gauge to mark two widths without the necessity of alteration. This supplemental gauge is attached by a thread on the collar shown at the right. The supplemental gauge consists of a solid bar of steel, the projection of which from the tube is controlled by a set-screw. In the end of the rod of this supplemental gauge a spur is inserted which is held by a set-screw and may be adjusted the same as the spur in the main gauge already described. The small tool becomes a very convenient adjunct for use in narrow and confined spaces. It is also provided with a second spur on the inner end, differing from the one on the outer end, as shown in the cut, by being placed as close as possible to the end of the rod, in order to mark near ledges, shelves, &c. When it is required to use this spur, which is driven tightly in place, the adjustable spur in the opposite end is removed and the rod reversed, which is quickly accomplished. In addition to the advantages above recited, this gauge, by being divisible in the middle, affords both a long gauge and also a comparatively short one, thus giving the mechanic the opportunity to use it in that form which is best for the particular work he is doing.

The Tubal Cain Tap, Die and Bolt Co., of New York City, are the assignees of the patent right in a screw-bolt upon which right and left hand nuts may be screwed. In order to receive reversely-cut nuts, bolts have herefore been made with reversely-threaded portions of different diameters, and also with reversed intersecting threads. These constructions are deemed objectionable, inasmuch as they either afford too little range in the adjustment of the nuts or they materially weaken the bolt. The new bolt has a single screw-thread having a full projection at opposite portions and a gradually reduced projection toward intermediate portions of the bolt. In other words, each coil of the thread is not of the same width throughout, but alternately widens and contracts. A bolt thus constructed will receive a right and left hand nut.

J. R. McElligott, of Chicago, Ill., has patented a fire-door casing for furnaces, which is to supply heated air to the fire-box. The casing consists of a bottom piece, a top piece and two side pieces, each piece being made hollow and of rectangular shape. After the several parts are placed in position they form the square fire-door opening between them. The hollow air spaces inclosed by the plates communicate with one another, and the air received through perforations in the bottom plate rises into the side and top plates, and being thus heated is discharged into the fire-box. In order to increase this supply of air steam may be forced into the fire-box from a steam-pipe entering the top plate.

English Interests in Asia.

In view of the enormous interests of England, present and future, in that part of the world, says Mr. Colquhoun, in a recent lecture.



A Very Remarkable Theory about Natural Gas.

As a curiosity we reproduce the following summary of a theory which it is alleged Dr. M. I. Aisbitt, of Pittsburgh, has propounded to a *Times* reporter:

Natural gas is produced by the law of metamorphosis, according to which all the elements composing the earth are in constant actual motion. This gas is continually eliminating itself from the surface of the earth, and is not pent up in any chamber or reservoir, as is generally supposed. As matter penetrates into the interior of the earth and reaches a certain temperature, decomposition takes place, the elements become separated and the hydrogen, which we call natural gas, reacts and begins to ascend to the surface. Suppose it meets oxygen on its way to the surface; the two elements combine and form water. This water is nature's agent for carrying out her law to bring solid matter to the surface, for we find by analyzing it that it contains various elements, as sodium, potassium, magnesium, iron and silica, proving that matter is in actual motion. Should the hydrogen fail to meet oxygen and come in contact with carbon, it combines with it and forms oil instead of water. This process of metamorphosis is going on throughout the interior of the earth, and natural gas will be found in greater or less quantities all over the earth wherever a well or a shaft is sunk.

The annual report of the arrivals of foreign and coastwise vessels at Philadelphia in 1885 shows an improvement in the foreign commerce and a decline in the coastwise trade. The foreign arrivals were 1359, against 1170 in 1884, the tonnage being 1,148,622 tons, as compared with 937,215 tons in the previous year. There were 4422 arrivals of coastwise vessels, while in 1884 they reached 5730.

Information has been received at the office of the American Window Glass Workers, from Belgium, to the effect that a 10 to 15 per cent. reduction has been made, and pending a settlement of wages, production has been largely curtailed in that country. Foreign advices indicate that supplies hitherto limited will likely be cut down still more during the next two months.

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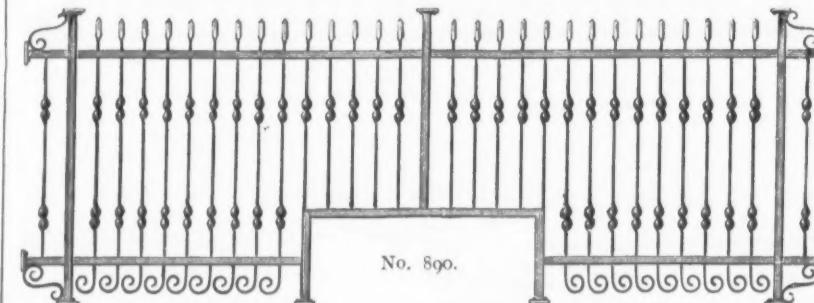
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THE WEEK.

The magnificent building of the Chicago Board of Trade, including the site, cost upward of \$1,900,000. Bonds to the amount of \$1,500,000 were issued at 5 per cent. interest, payable in 50 years. The expenses of the board, including interest, insurance and a pay-roll of \$50,000, make a total of \$194,000 annually. The receipts from rents and annual dues fall short of expectations, and, there being no provision for a sinking fund, the financial situation is disheartening.

The trade of the Lake Superior region finding vent through the Sault St. Marie Ship Canal has acquired an enormous volume, which is being increased by shipments of iron ore from Wisconsin and Minnesota, as well as cattle from Montana. The movement through the canal for the season of 1885, eastward alone, is estimated at 2,700,000 tons, an amount as large as that carried by eight trunk lines last year eastward out of Chicago.

Mayor Grace, of this city, in his annual message calls attention to the immediate necessity for legislation regarding the Dock Department, heretofore supported by the issue of bonds which cannot now be issued owing to the Constitutional amendment. Although the department has an available balance of \$328,957.46, this sum will not be sufficient to meet the pressing necessity for improved wharfage facilities. The Mayor also gives the items in the final estimate for this year as passed by the Board of Estimate and Apportionment, showing that, of the \$35,739,320.59 appropriated, \$22,141,597.71 had to be set apart in consequence of "mandatory" acts of the Legislature, and that a Constitutional amendment relating to the government of municipal corporations is demanded to prevent special legislation of the character here referred to.

A dog upset an oil can in Dunlap & Co.'s hat factory, in Brooklyn, and, the contents taking fire, the entire building was destroyed; loss, \$200,000.

The city indebtedness of Buffalo is \$8,000,000, and the resources over liabilities are \$1,935,000; rate of taxation, 2.36 on valuation.

The Secretary of State has just received and sent to Mr. Ericsson, the distinguished inventor, the Grand Cross of the Order of Naval Merit recently conferred on him by the late King of Spain.

James Renwick, the architect, strongly advises against entering upon the enormous work of constructing the proposed Quaker Bridge dam as an auxiliary to the New York water supply. He believes the dam will cost at least three times the \$4,000,000 or \$5,000,000 estimated. The foundations will be 100 feet below the surface of the Croton River and about 80 or 90 feet below the surface of the Hudson River. The soil excavated is gravelly, with seams of sand and quicksand. How is the water to be kept out of the excavation with a pressure on every square foot at the bottom of at least 4000 pounds? The Croton River is to be taken care of during the construction of the dam. In the January or February thaw which carried away the original dam the volume of the Croton River by calculation was at least 80,000,000 gallons per hour. It rose at the rate of 4 feet per hour, in spite of an overflow about 100 feet wide and 24 feet high, and carried away everything between the dam and the Hudson River. What has happened once may happen again.

The fact is significant, touching the foreign demand for American manufactured cottons, that, while the export trade of England in this line of merchandise has fallen off compared with 1884, the exports of our Eastern mills have increased fully 30 per cent., reaching 210,000 packages for 1885.

The Dominion custom-house officers are vigilant in excluding from their territory prison made barrels, and in the exercise of their authority seized a number containing pork imported from Joliet, Ill. In 1884 more than 80,000 barrels of pork imported into Canada were credited to Chicago.

It is stated on authority that it is Speaker Carlisle's intention to make the Select Committee upon American Shipbuilding and Shipowning Interests a very strong one in point of membership. To this committee are to be referred all propositions relative to American shipbuilding and shipowning interests, and the House has also given the committee authority to investigate the causes of the decline of the American foreign carrying trade. It is thought that the chairmanship of this committee should be given to Mr. Slocum, of New York, the State from whose ports more than 46 per cent. of our exports are shipped, and which receives for consumption and distribution more than 65 per cent. of our imports from foreign countries.

To encourage the proposed bridging of the Hudson River at Storm King, the Eastern manufacturers are said to have pledged themselves to send their cotton and coal by that route.

The Harlan & Hollingsworth Co., of Wilmington, Del., have contracted to build a light-draft steel boat for service in Siam. She will be shipped in sections. Although she will be used in carrying passengers and light freight, she is designed chiefly for exploring.

She is being built for an American gentleman and a brother of the King of Siam, and it is probable that they will have more boats built. She is to have a stern paddle-wheel, driven by a compound engine with 8-inch high pressure cylinder on one side of the boat and a 14-inch low-pressure on the other. Both cylinders will have a common stroke of 36 inches. She will draw 14 inches of water and have a speed of 10 miles per hour.

The arrivals of vessels at New York from foreign ports during the year 1885 show as clearly as before how steamships of large tonnage, notably those of England, are absorbing the carrying trade of the United States. The total arrivals of all classes number 5908, which is about the same as in the previous year. Of these 2585 are British, against 1773 American; and British steamers number 1262 out of a total of 2088, of which only 218 were American. Square-rigged ships hold their own better than any other class excepting schooners, which are almost as numerous as in former years. The coastwise vessels at New York number 14,371, of which 10,428 were from Eastern ports and 3943 from Southern ports. Of the total coastwise 1661 were steamers, including 442 from Eastern ports and 1239 from Southern ports.

P. M. Arthur, head of the Brotherhood of Locomotive Engineers, is in the city by invitation to act as mediator between the Elevated Railroad Co. and the engineers, who complain of ten instead of eight hours work per day.

William Baylies Crocker died after an illness lasting eight months, on Sunday last, at his residence in this city, aged 49 years. He was a member of the firm of Crocker Brothers, one of the largest iron houses of New York. He was born at Taunton, Mass., and completed his education at the Brown University, from which he was graduated in 1856. Immediately after that he came to this city, and, engaging in the metal business with his elder brother, George A. Crocker, he was taken into partnership in the firm of Bussing, Crocker & Co., which afterward became Crocker Brothers. He leaves a wife and two sons.

The Clyde shipyards announce a reduction of 10 per cent. on time-work and 12½ per cent. in piece-work in all classes of labor employed, to take effect January 21.

Work on the steel cruiser Atlanta, at the Morgan Iron Works, in this city, is being pushed with vigor.

The Legislature of South Carolina has just repealed an act of 1872 exempting factories from taxation for a period of 10 years from the time of their beginning operations. This action, it would appear, is due to the belief that sufficient time has been allowed capitalists to invest their money in these industries, and that they are now on such a basis as to need no further encouragement or support from the State.

The *Drovers' Journal* contains a review of the live stock trade of Chicago for the year 1885. The receipts of cattle, hogs and sheep are shown to have increased largely over those for the previous year, and the value of all the live stock received is estimated at about \$200,000,000.

The grain trade of Baltimore for the past year shows a heavy decrease. Of wheat only about 5,500,000 bushels were exported, against 16,500,000 bushels the previous year, but of corn there were shipped 13,718,000 bushels, which is an increase of 8,000,000 bushels. Prospects for the coming year are much better.

An unusually large proportion of wheat has been in warehouse at various points during the past season, at a heavy cost. In Chicago alone the average cost of storage each day during the summer season was about \$20,000, including insurance and interest accounts. The magnitude of the load has not only made buyers on the other side of the Atlantic stand aloof, believing that it would soon be necessary to offer it to them at lower prices, but it has invited bear speculation, thus adding to the weight.

Our imports of foreign wool at this port during the year 1885 comprised 110,478 bales, valued at about \$4,900,000, surpassing the total of the previous year some 34,000 bales.

A review of the industrial growth and resources of South Carolina, covering a period of five years since the United States census of 1880, shows that the capital employed in manufacturing has increased from \$11,205,895 to \$23,367,510, while the products have increased from \$16,738,008 to \$38,403,257. 240 miles of railroad have been built, at a cost of \$2,000,000; the people have added in five years \$6,300,000 to the total wealth of South Carolina.

A dispatch from Tamatave, dated December 20, says: "The treaty of peace between France and Madagascar, it is reported, cedes territory to France, surrenders the northern ports which France originally claimed, and gives the French Government supremacy over the foreign relations of Madagascar."

A man-of-war has raised the German flag over the Marshall and Gilbert groups of islands in the Pacific Ocean and established a protectorate. The population numbers about 25,000, and, under the instruction of

American missionaries, have become civilized. One of the secretaries of the American Board says that, although the mission had done their utmost to foster trade with the islands, and naturally sought to direct that trade into American channels, they allowed the natives to govern themselves. He did not think the German Government would in any way interfere with their work outside of diverting the trade of the islands into German channels.

The German navy consists of 13 ironclads, 14 armored gunboats for coast defense, 9 cruiser frigates, 10 cruiser corvettes, 5 cruisers, 4 unarmed gunboats, 8 dispatch-boats, 10 training ships, 1 surveying vessel, 2 transports, 12 vessels for harbor service, and 10 pilot vessels and fireships.

An experiment is being tried at Portsmouth, in England, with the object of determining the practicability of applying liquid fuel as a steam generator to men-of-war, and with fair prospects of success. The fuel consists of creosote, which is procurable at a penny a gallon.

The Pennsylvania and Lehigh Valley railroad companies have closed contracts with the Eastman Freight Car Heater Co. for the use of their automatic heating and ventilating appliances in the transportation of perishable freight.

The secretary of the Milwaukee Chamber of Commerce, in his report for 1885, refers to the diminished importance of that city as a wheat market, and finds satisfaction in the proof thus afforded that the great region directly tributary to Milwaukee, instead of increasing its production of wheat, has now capital enough to diversify its agriculture.

According to a Government report just issued the value of the coal mined in the United States in 1884 was \$143,760,000, while the silver and gold product for the same year amounted in round numbers to scarcely \$80,000,000.

There is nothing in the statistics of railway traffic, remarks the *Railroad Gazette*, to indicate a great increase in railroad profits in the coming year, though there is much to indicate that they will be decidedly larger than the extremely unsatisfactory ones of most of this year or of the 12 months ending with August last. The good times of 1880 came after three successive bountiful harvests and when there had been an enormous increase in our chief exports. Now exports are, as they have been since the first half of 1881, unusually light, and one of the chief crops is exceptionally poor. On the other hand, the recent depression was never so severe as that after the panic of 1873, and it is reasonable to suppose that we shall recover from it more quickly. The development of other industries has been so much more rapid than the growth of agriculture, and the population has increased so greatly, that the crops and the prices of grain and cotton and the exports are relatively less important than they were six or eight years ago.

Charleston, S. C., has 60,145 inhabitants, against 39,984 in 1880, an increase of over 20 per cent. The white population is 27,605 and the colored 32,540.

The Empire of Turkey is falling to pieces rapidly ever since the close of the Russian war. The fact is evident in every department of the public service. A correspondent of the *London News*, writing from Constantinople, says: "The stagnation which reigns in business is of the most terrible kind. Branches of trade which were almost monopolies of Turkey have been lost. The transit trade to Persia has gone. The trade with Bulgaria might have been kept if the Turks would have allowed Constantinople to have been a port of transhipment. As they insisted upon merchandise intended for that Province paying Turkish customs duties, in which case the goods would have to pay twice over, merchants naturally sent their wares direct to Bulgaria, to the ruin of those merchants who had been engaged in the importation of goods for Bulgaria. The effect, I may mention incidentally, has been to the benefit of German and Austrian manufacturers, whose goods are sent down the Danube. The trade had hitherto been largely in the hands of English and French manufacturers. The intention of Turkey was, of course, merely to benefit itself and to spite the Bulgarians; the effect has been to deprive Turkey of any advantage whatever from commerce with the richest portion of the Empire. The measure of the encouragement given to trade may be taken from the fact that the local post which was suppressed some four or five years ago, lest it should facilitate conspiracy, still remains abolished. Let Londoners in business try and realize what such a fact means."

Building operations in New York City during the year just closed were on an enormous scale, the total cost of all for which plans were filed being estimated at \$44,214,000, against \$41,461,208 for the previous year, an aggregate rarely surpassed in the history of the city. If the plans for the Equitable Life Assurance Society are included, descriptive of the contemplated new building on Broadway and Cedar street, the total estimated cost of new buildings for which plans are filed will be swelled to over \$46,000,000. In speaking of the year's building operations Superintendent D'Oench said there had been a large increase in the

number of dwelling houses and flats of moderate cost, and a marked falling off in the number of tenement-houses, both of which are desirable features, indicating an improvement in the general average condition of the inhabitants.

The Maritime Provinces of the Dominion all report a very large decrease in the total shipping tonnage during the past year, particularly in that owned in New Brunswick. In that Province the tonnage is now 288,257, or 10500 tons less than at the close of 1884. The present tonnage of Nova Scotia is 541,070, a decrease of 2785 tons. The tonnage of Prince Edward Island is 36,040, a decrease of 3173 tons. The returns show a total decrease in the three Provinces of 25,463 tons.

The schooner J. B. Atkinson, from Mobile, reports that in a gale off Hatteras she was saved only by towing bags of oil astern. In an article on "The Use of Oil at Sea," by Lieut. John P. Holditch, R. N. R., the author says: "The results I have obtained are these: Fish or colza oil only is of any good; it does not matter how dirty it is so long as it is not thick. Paraffine is too thin; paint oil too thick. Running before a gale naturally expends much more oil than 'laying to'—you have so much more water to oil. Carefully expended, 1 quart in three hours for running, 1 pint in four hours for laying to, will be sufficient. The means I used was a canvas bag (No. 6), with large holes stabbed with a needle. I have heard of a bundle of oakum being saturated with oil, and then put in a coarse gunny bag, which I think would admit of a thicker oil being used for the time. The place for towing is undoubtedly forward, not aft. Whether in head-reaching oil could be used successfully I cannot say, but I doubt it. When running dead before the wind, tow from each cat-head, and the ship is as safe as anything can be at sea."

The Union Iron Yard, at Buffalo, has concluded a contract with the Anchor Line of Lake steamships for a new iron steamship to be built from plans furnished by G. B. Mallory, of New York, of the following dimensions: Length between perpendiculars, 320 feet; width of beam, 40 feet; depth of hold, 23 feet; with seven water-tight compartments, single bottom, except in the compartment occupied by the machinery, which will have a second or water bottom with space to contain about 100 tons of water. She is to be completed next season.

Capt. Thomas Wilson, of Cleveland, Ohio, has contracted with the Globe Shipbuilding Co. for a steel steamer to be 264 feet long over all, 250 feet between perpendiculars, 38 feet beam, and 24 feet depth of hold, with four iron pole masts.

The Standard Oil Co. are perfecting their plan to force natural gas of Worthington engines from the Bradford field to Buffalo, a distance in a direct line of about 65 miles, and another line to Philadelphia and Baltimore, about 300 miles. The general manager says gas will also be piped to Cleveland, and pipe will be laid in Youngstown as soon as spring opens.

The estimates of the statistician of the Department of Agriculture for 1885 for the principal cereals are completed, and the aggregate bushels are as follows, in round millions: Corn, 1936; wheat, 357; oats, 629. The area of corn is 73,000,000 acres; of wheat, 34,000,000; of oats, 23,000,000. The value of corn averages nearly 33 cents per bushel, and makes an aggregate of \$635,000,000, \$5,000,000 less than the value of the last crop. The decrease in the product of wheat is 30 per cent., and only 17 per cent. in value, which is \$275,000,000. The valuation of oats is \$180,000,000. The production of all cereals is larger than that of any former year.

A single Chicago packer ships 125 carloads of refrigerated beef per day for European markets. The cars are kept cool by ice and the meat is transferred into steamers chilled in the same manner. The chances of such cargoes are varying. Not infrequently it happens that an entire consignment is spoiled by the failure of the ice supply through some unexpected delay in the passage.

It may be remembered that Gould's American cable was leased to the Western Union on a 5 per cent. guarantee of its \$14,000,000 stock. According to recent calculations this guarantee, together with the running expenses and cost of repairs, have not only eaten up all the receipts from the business of the cables, but from \$200,000 to \$300,000 besides.

It is said that an enormous aggregate of cotton, sugar and other products is being carried by New Orleans factors and merchants awaiting a rise in prices.

The superintendent of motive-power in the Pennsylvania Railroad Co. has placed a steam steamer on their ferry-boat Baltimore, and is contemplating putting them on the rest of their fleet, as a safeguard against collision.

The customs receipts at the port of Montreal for 1885 were \$6,682,701, as against \$6,787,721 for 1884, showing a decrease of \$105,020.

Three full sets of galvanized wire rigging have been ordered from the Roebling Wire Works for vessels building in Bath, Me.

The Cramps, of Philadelphia, will soon have two iron steamers in course of construction, one for the Southern Pacific Co.,

Morgan Line, and one for the Erie Railroad ferry service between New York and Jersey City. These two contracts will amount to at least \$500,000.

Conflicting reports are circulating in regard to the proposed Maryland and Delaware Ship Canal, one being that the Pennsylvania Railroad Co. expect soon to get possession of the franchise.

Six men were killed and as many more hurt by the explosion of a boiler at the Gulf City Oil Mills, Mobile, Ala. The accident seems chargeable indirectly to foaming, which prevented the fireman from knowing that the water was low.

Lord Lorne, in one of the reviews, discusses at some length the relations between the United States and Canada. He does not think that the United States has very great attractions for Canadians, or that the feeling in favor of annexation is either general or strong. His observations have led him to believe that Canadians are moderately desirous of more intimate trade relations with the people of the United States, but are not prepared to make very great sacrifice in any direction to obtain them. The tendency of Canada, Lord Lorne suggests, rather than openly indicates, is toward independence.

A decision rendered by the United States Supreme Court at Washington in the case of the Illinois Central, Mobile and Ohio and other railroads is favorable to State control.

A ladle which facilitates the transfer of molten metal has been patented by H. Schulze-Berge, of Rochester, Pa. The discharge opening is made at the corner formed between the side and bottom of the ladle. This portion of the vessel is fitted with a conical seat designed for the reception of a conical stopper which is provided with a longitudinal bore. The stopper is connected to a shaft or axle surrounded by a coiled spring and operated by a hand lever. The spring holds the stopper tightly to its seat, its tension being regulated by a nut. When it is desired to discharge the molten metal the lever is turned so as to bring the bore of the stopper in line with the discharge orifice. To close the ladle the orifice and stopper bore are brought out of line. Thus it will be seen that the molten metal does not enter between the stopper and its seat, and consequently neither of these parts is exposed to wear by the metal.

The *Railway Age* summarizes as follows the record of new railroad mileage in 1885: "When the year 1885 opened very little was expected of it in the way of railway building. The record for the year as we now present it shows that this assumption was far from being correct, and that while the extent of new mileage added is less than in 1884, and very much less than in several previous years it is by no means insignificant. The total length of main line, not including second track, sidings or renewals, laid in the United States during 1885 was 3113 miles. This is about 700 miles less than the new mileage of 1884, and it is less than in any year since 1878, when the total was but 2687 miles, while in 1875 the record of new constructions reached only 1711 miles. The new track laid this year is distributed as follows: New England States, 4 lines, 13½ miles; Eastern and Middle States, 26 lines, 281.9 miles; Middle and Western States, 31 lines, 464 miles; Southern States, 44 lines, 727.4 miles; Missouri belt, 21 lines, 542.5 miles; Kansas belt, 24 lines, 828.6 miles; Colorado belt, 2 lines, 14 miles; Pacific belt, 14 lines, 240.9 miles; total, in 34 of the 47 States and Territories, 166 lines, 3112.8 miles. The work done has been largely on branches and extensions of moderate length, and has not included any very large lines, such as in previous years have helped greatly to swell the total. In New England and the East almost no new track has been added. The principal activity has been in the Southern States and in the belt between the Missouri River and the Pacific States and Territories."

F. W. Dick and J. Riley, of near Glasgow, Scotland, are the patentees of a regenerative furnace for making steel. Two small and two large regenerative chambers are placed in a square around the main furnace. These chambers consist each of a vertical cylindrical iron or steel shell lined with fire-brick. Near their upper ends the chambers communicate with the furnace by means of flues, so arranged that the air flues from the larger chambers enter immediately above the gas flues from the smaller chambers. The air flues are directed downward into

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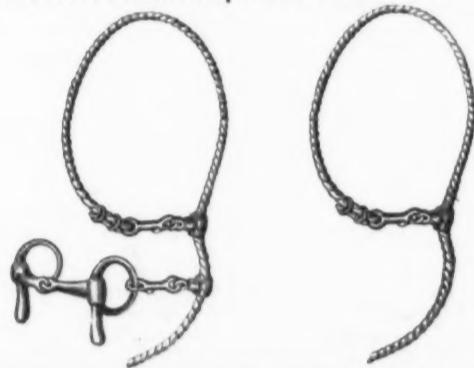
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The Cattle Tie is the same as the Horse Tie, less one Snap and Thimble, and has eight and one-half feet of rope, instead of ten.



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January 7, 1886.

THE IRON AGE.

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Annual Review of the Metal Market for 1885

(Concluded from page 9, December 31.)

Tin.

The year was inaugurated with a better feeling, Straits opening in London at £74.10/ and soon rising to £77, and in New York at 17 1/2¢, the visible supply on this side being 2400 tons, while in England and Holland it was 15,618, against 15,988 in 1884, and 15,221 in 1883. Shipments from the Straits settlements to the United States during the first 11 months of 1884 had been 57,379 piculs, against 106,231 in 1883. London, however, soon reacted to £74.5/ recovered to £76.5/ and wound up the month at £74.7/6. The December deliveries in England and Holland had been 1800 tons, against 2080 the previous year, while our own December consumption had been only 750 tons. The month closed at 16 1/2¢. The joint consumption in Europe and the United States in 1884 had been 35,400 tons, against 34,260 the previous year and 32,000 in 1882.

February opened with a visible supply on this side of only 2000 tons, causing the price to advance to 17 1/2¢ and later on to 17 3/4¢, while in London it rose during the month steadily to £78.15/ the statistical position inspiring confidence. The total shipments to Europe and America from the Straits and Australia in January had been 2660 tons, against 2140 in 1884 and 2185 in 1883. The European deliveries were 2170, against 2572 and 1993.

In March the speculators for a rise in London and New York made a first great attempt to advance the market, but it proved rather premature. The price opened at £78.12/6 and 17 3/4¢, with a visible supply here of 2300 tons, February deliveries here having been only 550 tons, whereas in Europe they were 2610, against 2308 the previous year. While the closing price here was 17 3/4¢, it was £78.12/6 in London. Two circumstances had checked an improvement for the moment—the continuation of the Franco-Chinese war and the bad weather here.

In April the strained relations between England and Russia threw the merchandise market in London into temporary confusion, which the chief operator there availed himself of to buy a little more Tin, and when, later on, the war cloud was dispelled, the metal seemed ready for a serious rise. On this side the visible supply on April 1 proved to be 2300 tons, consumption in March having been 600 tons, while the total visible supply between Europe and America was 14,981 tons, against 14,530 and 17,100 in 1884 and 1883 respectively. Opening at £78.12/6 and 17 3/4¢, the markets closed the month at £79.10/ and 18 1/2¢.

In May the peaceful outlook in Europe on the one hand, and the better disposition to speculate in merchandise on the other, chiming in with the manipulations for a rise in Tin, carried the improvement in the latter to £92 and 19 1/2¢. Here the visible supply had been swelled to 2900 tons on the 1st of May, after an April consumption of 600 tons, winding up with the visible supply in Europe on May 31 with 15,318 tons, against 15,057 in 1884. A peace settlement between France and China having been arrived at, there was evidently nothing left to obstruct the onward course of the speculative movement in London in June. The latter opened at New York with a visible supply of 2750 tons, after a May consumption of 600 tons.

The price in London on June 1 stood £91.5/ and at New York 19 1/2¢, while at the close of the month the price was £94 and 21 3/4¢, respectively. A momentary stoppage in the Suez Canal transit had even been availed of to help the advance in London; nay, even the American statistics had been tampered with and distorted to play into the hands of the Anglo-American speculative ring.

On July 1 the price stood £94 in London and 21 3/4¢, in order to advance during the month to £94.15/ and recede to the opening figure, while in New York the closing figure was 22 1/2¢. The net import into the United States during the fiscal year ended June 30 had been 10,667 tons, against 11,153 in 1884, and shipments from the Straits this way during the first five months only 960 tons, against 1470.

August opened with a visible supply here of 2300 tons, against 2250 the previous month, and a July consumption of 900 tons, against a June one of 600. The repeated complaints about garbled statistics and the proofs furnished that they had been at two openings intentionally falsified at length stirred up misgivings about the entire Tin speculation, and the trade resolved to operate no further than the actual current demand warranted; in fact, every body not immediately interested set his face against a metal so disreputably manipulated, causing a general feeling of indifference and apathy not favorable to the maintenance of a wholly artificial price. Such being the case, the metal was allowed to drop in all August to £90.5/ in London, and 21 1/2¢ here. Meanwhile the supply for the American market had gone on swelling steadily, so that it stood on September 1 at 2850 tons, against 2650, September 1, 1884, after an August consumption of 900 tons, and the price wound up dull on September 30 at this point at 20 1/2¢, while in London, which had transferred part of its stock this way, the price was more than upheld, and closed at £92. It should here be remarked, however, at once, that the general suspicion in which the metal was held by the trade in Europe and here, dating from September-October, caused consumption on both sides of the Atlantic to fall off some 3000 tons in the aggregate, thus furnishing a striking proof of the doctrinal effect which the manner in which the upward movement had been engineered had exercised on the actual use of the metal. Thenceforward the latter was characterized by inherent weakness, although at times the speculative element succeeded in advancing the price a trifle. Net import into the United States during the first seven months, 4860 tons, against 5642 in 1884.

On October 1 the visible supply on this side was 2945 tons, against 2150 on October 1, 1884, and during October the price declined in London to £90.10/ and in New York to 20 1/2¢. Net import into the United States

the first eight months, 14,386,789 lb, against 16,075,921 in 1884. Visible supply in Europe and America end of October, 14,135 tons, against 14,108 in 1884, and 14,635 in 1883. October deliveries in London and Holland, 2670, against 3622 and 2120. In November the sudden and important advance in Copper and general improvement in metals gave the manipulators in London a welcome pretext for pushing Tin higher once more, causing a rise to £93.10/ at the close of the month, while here we sluggishly followed, and wound up at 20 1/2¢, but the supply on this side had by this time become inconveniently liberal, so that on December 1 we had a visible supply of altogether 3440 tons, against 2585 in 1884 and 2390 in 1883, after November consumption of 1000 tons. Import into this country first 10 months, 19,761,081 lb, against 20,786,305 in 1884. In December the metal elicited but slight active interest on both sides of the Atlantic, and the market was allowed to finally settle down to £92.15/ and 20 1/2¢.

Price of Straits Tin at New York.

Jan.	84. 18 1/2¢ @ 18 1/2¢	Jan.	85. 17 1/2¢ @ 17 1/2¢
Feb.	84. 18 1/2¢ @ 18 1/2¢	Feb.	85. 17 1/2¢ @ 17 1/2¢
Mar.	84. 18 1/2¢ @ 18 1/2¢	Mar.	85. 17 1/2¢ @ 17 1/2¢
April.	84. 18 1/2¢ @ 18 1/2¢	April.	85. 17 1/2¢ @ 17 1/2¢
June.	84. 18 1/2¢ @ 18 1/2¢	June.	85. 17 1/2¢ @ 17 1/2¢
July.	84. 18 1/2¢ @ 18 1/2¢	July.	85. 17 1/2¢ @ 17 1/2¢
Aug.	84. 18 1/2¢ @ 18 1/2¢	Aug.	85. 17 1/2¢ @ 17 1/2¢
Sept.	84. 18 1/2¢ @ 18 1/2¢	Sept.	85. 17 1/2¢ @ 17 1/2¢
Oct.	84. 18 1/2¢ @ 18 1/2¢	Oct.	85. 17 1/2¢ @ 17 1/2¢
Nov.	84. 18 1/2¢ @ 18 1/2¢	Nov.	85. 17 1/2¢ @ 17 1/2¢
Dec.	84. 18 1/2¢ @ 18 1/2¢	Dec.	85. 17 1/2¢ @ 17 1/2¢

Lead.

The price of Common Domestic Lead opened in January at \$3.67 1/2 in New York, and Soft Spanish at £11.10/ in the London market, the metal being considered favorably situated from a statistical point of view. The chief operator here as early as the first month of the year endeavored to cause an advance, but the demand being slack, and the severity of the season militating against an appreciation, the market flattened again after some 3000 tons had changed hands at \$3.55 @ \$3.70, the closing price for the month being \$3.62 1/2.

Lead Production in the United States.

CENTS PER POUND.		
PRICE OF COMMON DOMESTIC LEAD AT NEW YORK—		
	Short Tons.	Short Tons.
Utah	25,000	28,000
Nebraska	5,000	4,000
Colorado	70,557	62,165
Montana	5,000	7,000
Idaho	6,000	7,500
New Mexico	2,400	6,000
Arizona	1,900	2,700
California	1,700	1,600
Missouri, Kansas, Illinois and Wisconsin	21,600	19,676
Virginia	200	250
Total.	145,967	139,897
Of which argentiferous	122,157	119,965
	21,800	19,932

February was even duller than January, leading to sales of only 2000 tons, and after a few slight fluctuations the month wound up at the previous closing figures of 3 1/2¢. Spanish pig-lead exportation during the first 11 months of 1884 had been 108,227 tons, against 116,049 in 1883 and 106,783 in 1882. Soft Spanish closed in London at £10.10/.

In March, St. Louis and Chicago reported large sales of Corroding Lead to White Lead manufacturers, whereas Lead manufacturers in this city still held back, there being no indications of briskness for the spring trade. Hence only 2500 tons sold, but the closing figure was slightly higher, \$3.70. Spanish export in 1884 had been 116,293 tons, against 128,420 in 1883 and 115,263 in 1882. London closed at £10.7/6. While in Europe Lead began to stiffen again in April on the strength of the reviving demand for China after the French blockade had ceased, it displayed even greater sluggishness here, the spring campaign proving a partial disappointment and the manufacturers' competition here keeping low the price of goods in the line. In this manner only 1000 tons sold during the month, the price meanwhile keeping steady, \$3.70, while London recovered to £10.15/. Spanish January export, 10,365 tons, against 11,721 and 10,407. Although May brought a little more business, 2000 tons selling, the market lacked strength, and the month wound up at \$3.60, whereas London improved to £10.7/6. While in Europe Lead began to stiffen again in April on the strength of the reviving demand for China after the French blockade had ceased, it displayed even greater sluggishness here, the spring campaign proving a partial disappointment and the manufacturers' competition here keeping low the price of goods in the line. In this manner only 1000 tons sold during the month, the price meanwhile keeping steady, \$3.70, while London recovered to £10.15/. Spanish January export, 10,365 tons, against 11,721 and 10,407. Although May brought a little more business, 2000 tons selling, the market lacked strength, and the month wound up at \$3.60, whereas London improved to £10.7/6. 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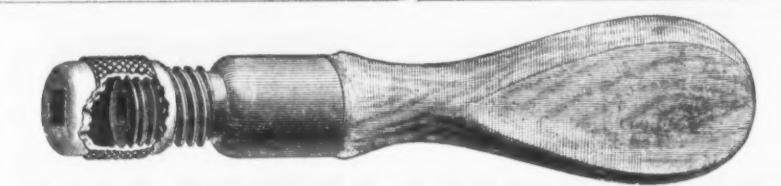
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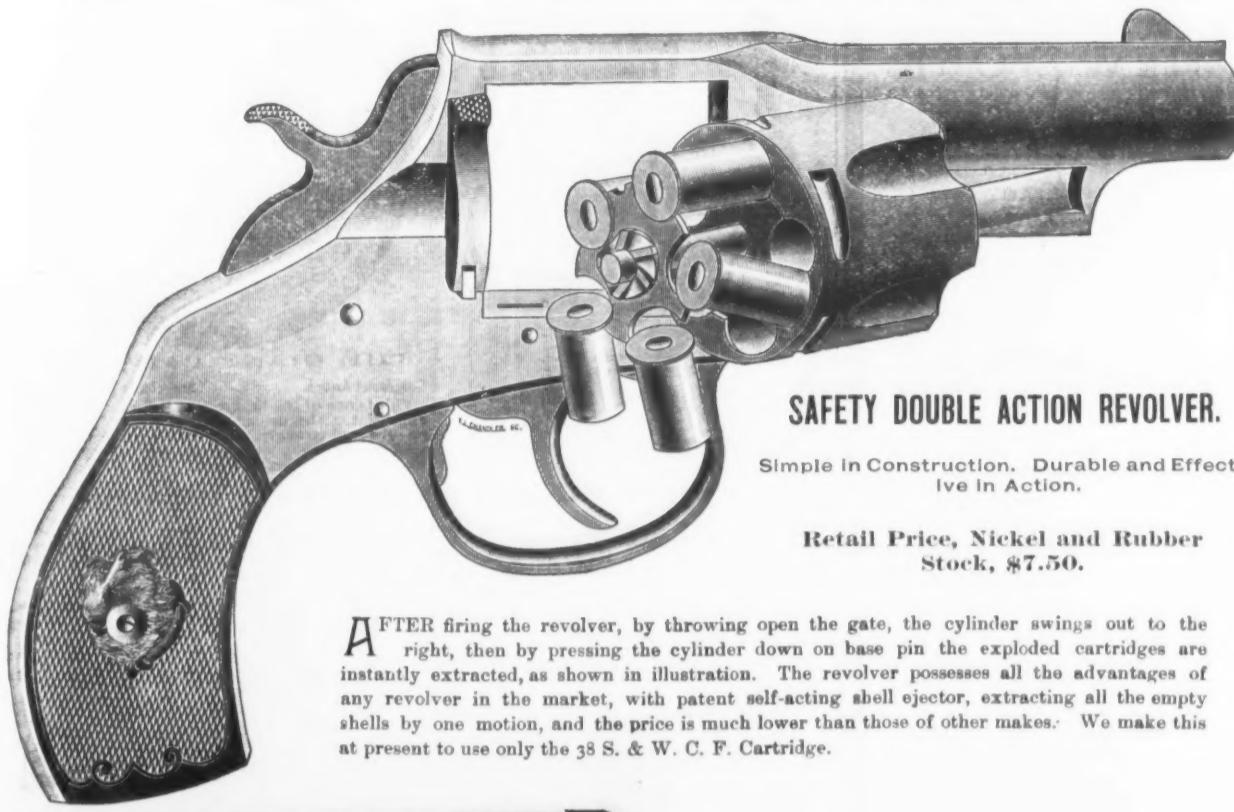
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Dear Sir—In reply to your favor of January 26th, the Valves we received from your Company, in September last, were placed on the most severe parts of the engine, and are still in use. Those made of ordinary leather often last but a few days. We find your Valves to be the best we have ever used.

Yours respectfully,
D. J. MORRELL, Gen'l Manager.

REFERENCES.—Messrs. Cooper & Hewitt,
Cambria Iron Co., Sharon Iron Co., Missouri
Furnace Co.

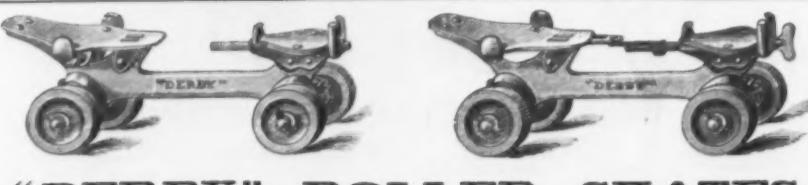
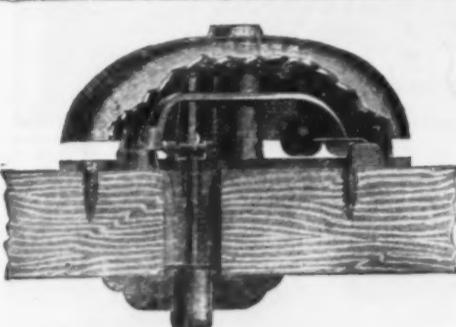
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This Gong Bell is cheap, simple and durable. There is nothing connected with it liable to get out of order, and is sure to give satisfaction wherever it is used.

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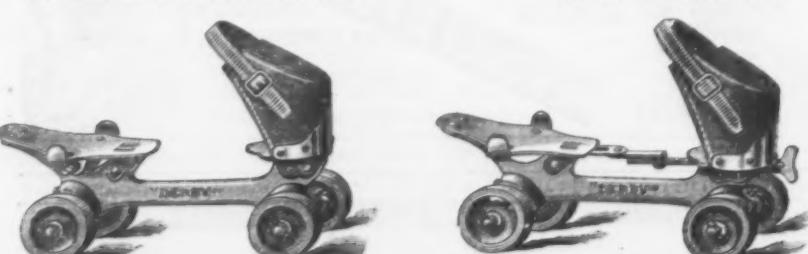


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Manufactured by SISE, GIBSON & CO.

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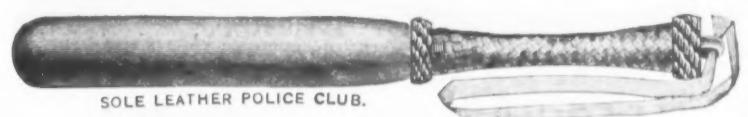


This wonderful combination of heat and light is a marvel of convenience and economy, furnishing a powerful and pleasant light, and a heat sufficient to cook, broil and bake. Adapted for light Housekeeping, Nursery, Camping, Milliner, Chemist, Photographer, Saloonist, &c. &c.

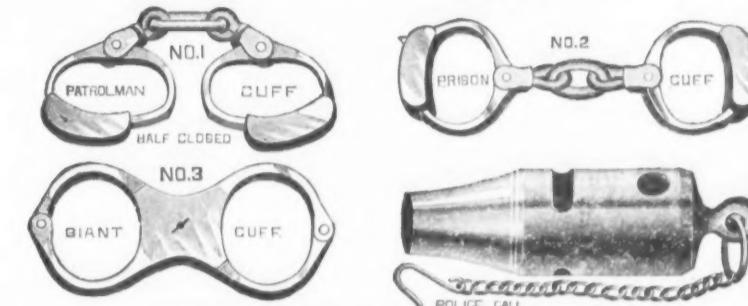
Weight of Lamp and Stove, 5 lbs. each.

We make the 2, 3 and 4 Burner light Oil Stoves for export. Special prices to the Trade on application. For further information, address

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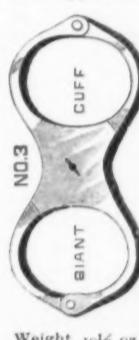
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MANUFACTURED AND FOR SALE BY
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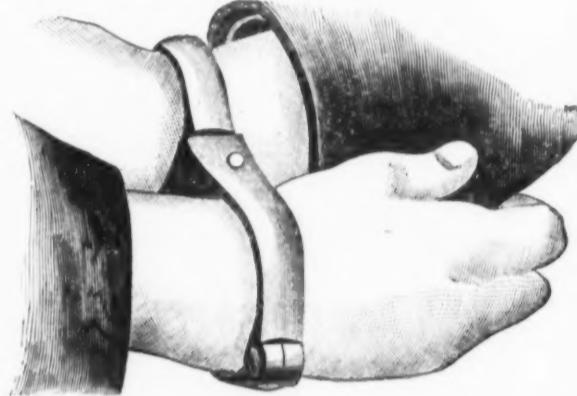
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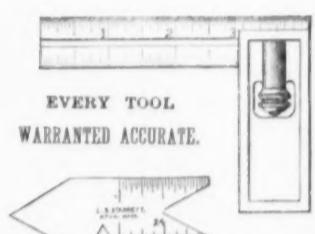
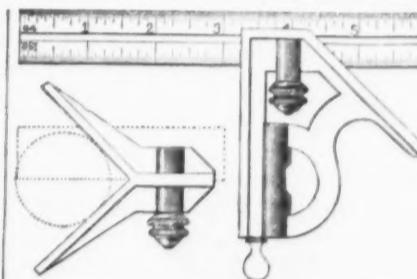
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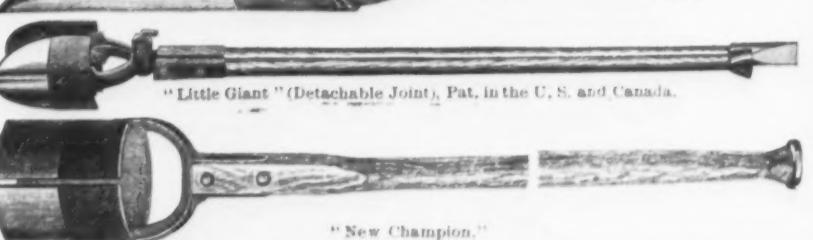
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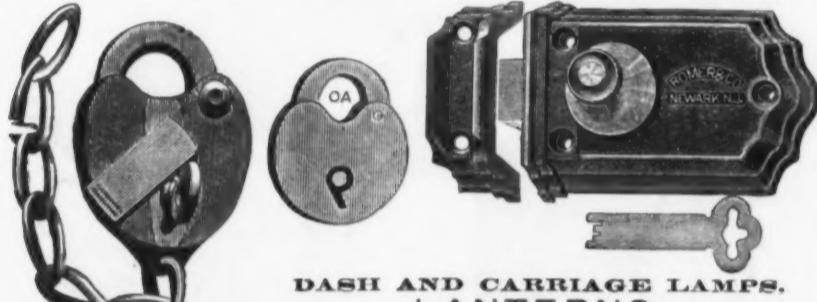
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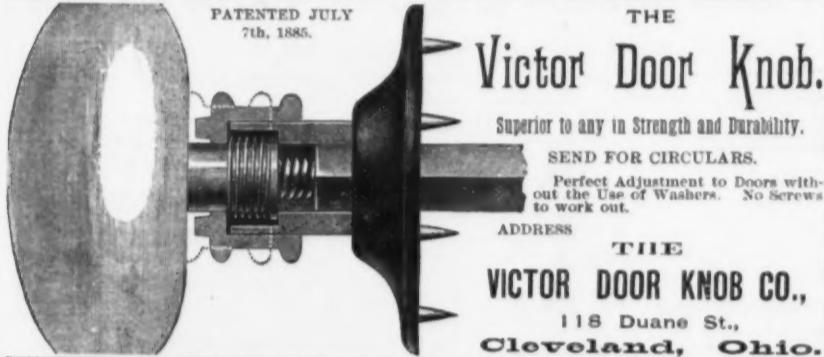


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PATENTED NOVEMBER 6, 1884.

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10. The finest grained metal in the market.

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N. B.—The nature of this metal is such that any dust, sand or grit which may find its way to the shaft through oil holes or otherwise does not grind between lining and shaft, but is immediately imbedded in the metal, thus preserving shaft in perfect condition.

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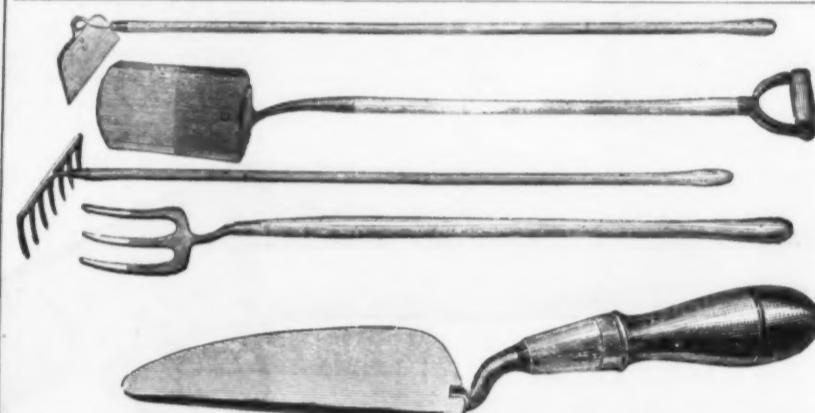


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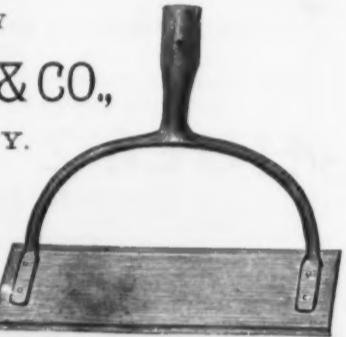


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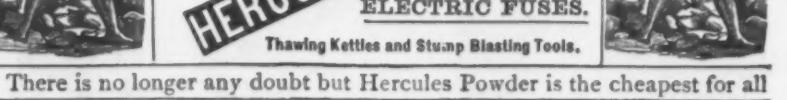
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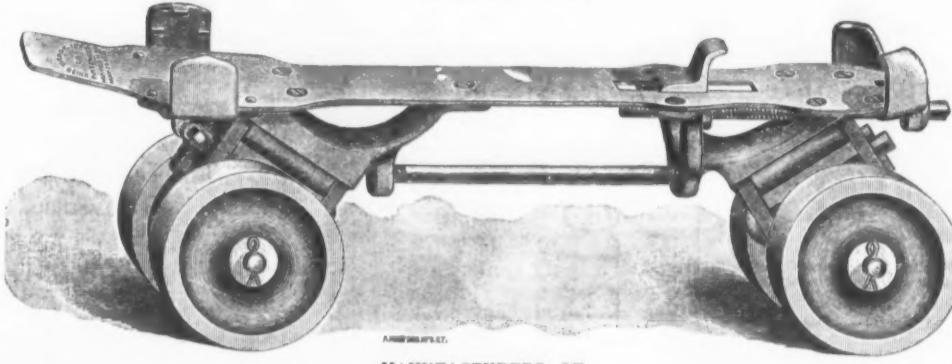
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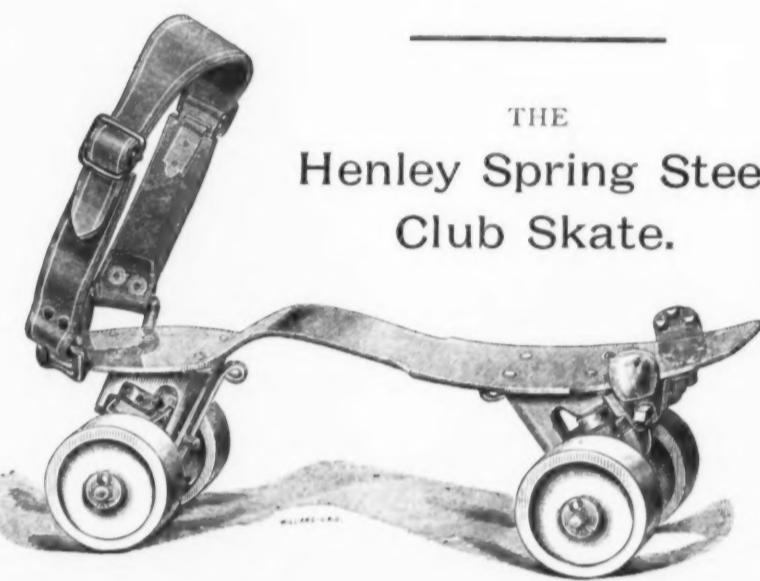
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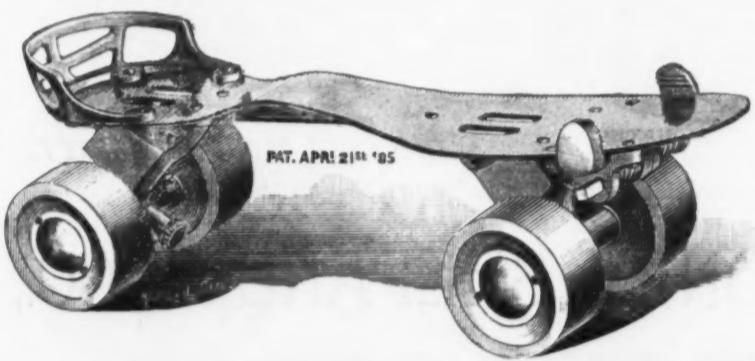
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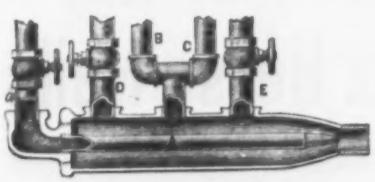
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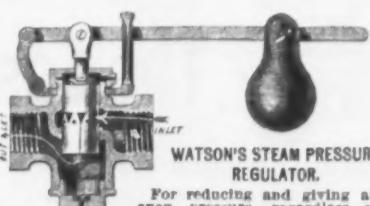
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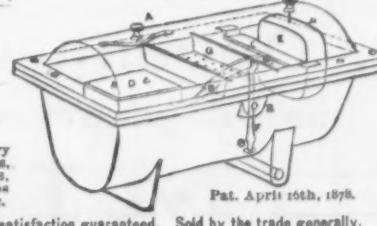
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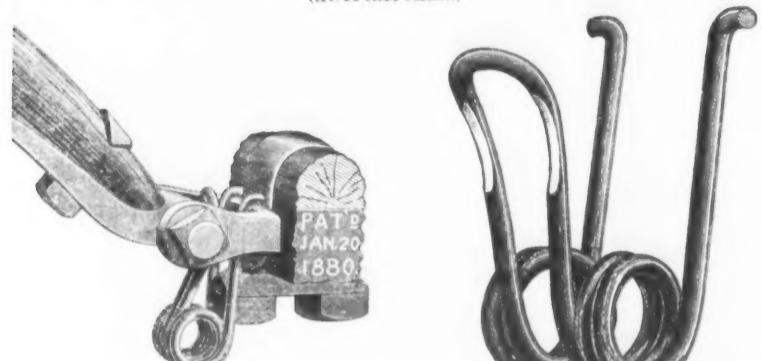
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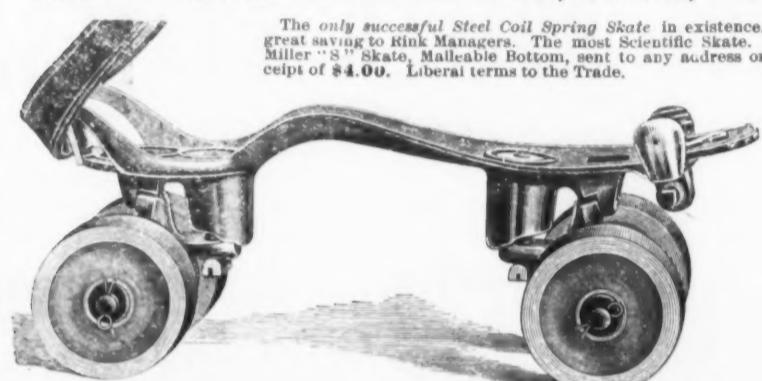
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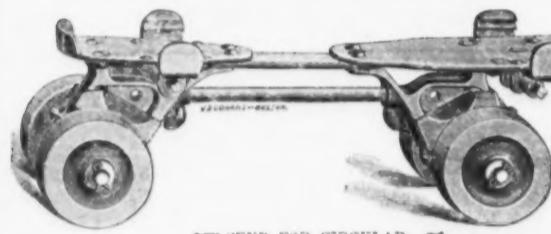


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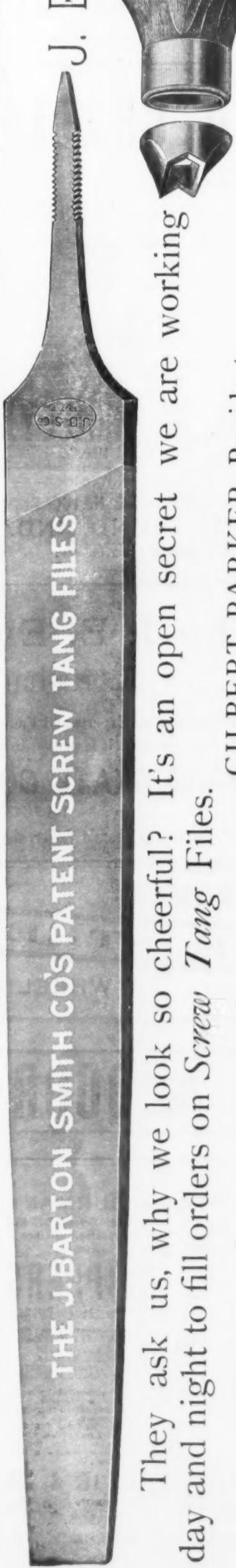
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10, 12, 14 and 16 inch cut.

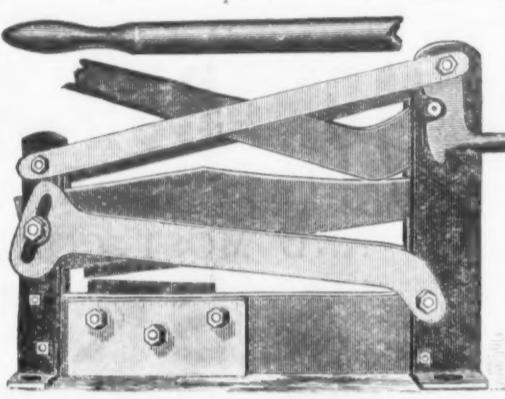
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We also make a special ma-
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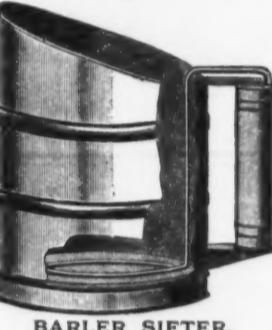
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" 2	2 knives, " " "
" 3	3 " " "
" 4	4 " " "
" 5	3 " " 9 x 30, "
" 6	2 " " 12 x 36 each.
" 7	3 " " "
" 8	4 " " "
" 9	3 " " 12 x 40, "
" 10	4 " " "



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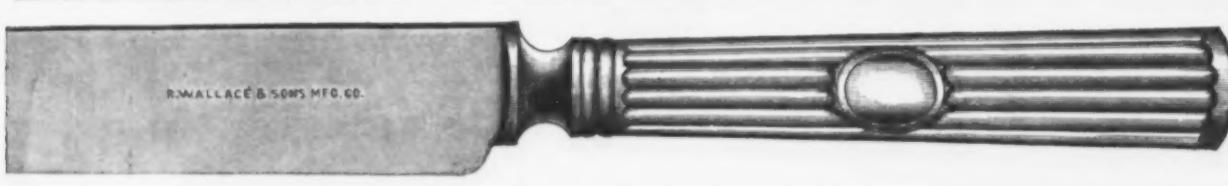
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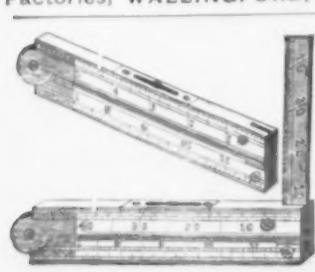
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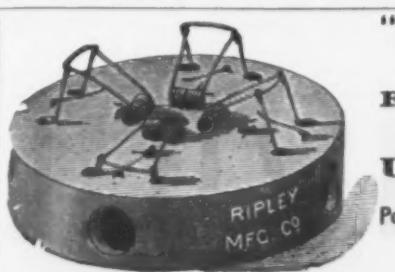
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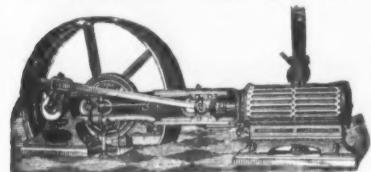
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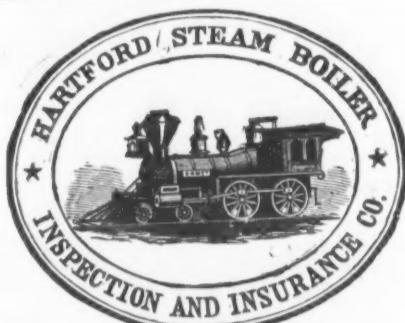


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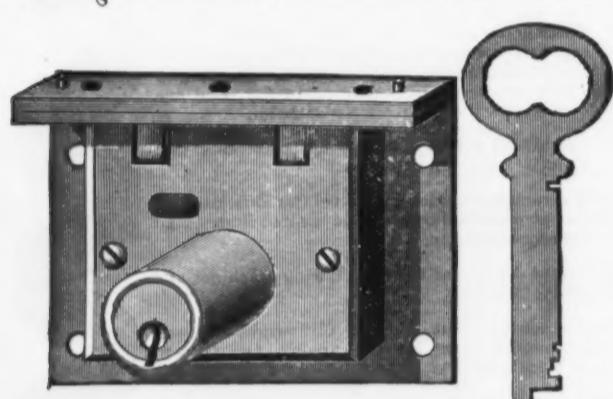
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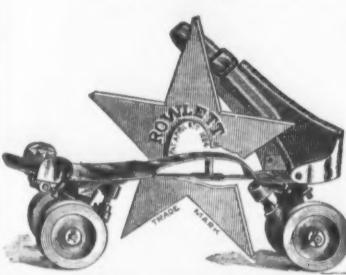
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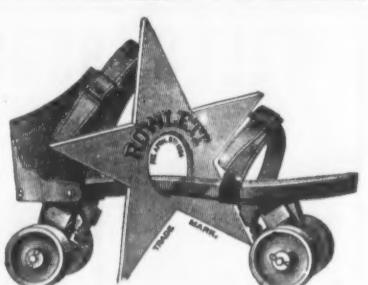


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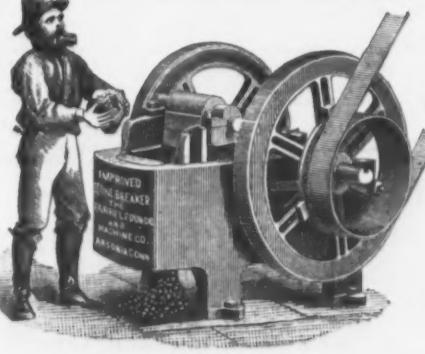
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DESCRIPTIONS AND PRICES.

Card No.	Size and Price Per Card.
1	A—BAR IRON, Weight of Round, Square and Flat, per Foot, and Tire per set. Western Classification and Prices of Extras on American, Norway and Sweden.
	B—BAR STEEL, all Kinds and Sizes with Prices of Extras. Horse and Mule Shoe Size, Weight, No. in Keg. Toe Calks. Cut Nails, List of Extras.
2	A—CUT TACKS, Exact size cuts. Length. Number in a pound.
	B—LARGE HEAD CARPET TACKS. Gimp and Lace Tacks. Hungarian Nails, Hob Nails, Blued and Tinned, American and Sweden. Exact size cuts shown of all the above.
3	A—SHOE NAILS. Cigar Box Nails. Copper Tacks, Double-Pointed Tacks and Cuts. Glaziers' Points and Cuts. Barbed Blind Staples.
	B—PATENT BRAIDS. Finishing Nails. Blued Clout Nails. Tinneu Clout Nails.
4	A—IRON WOOD SCREWS.
	B—IRON WOOD SCREWS (continued). Iron Machine Screws.
5	A—STANDARD CARRIAGE BOLTS.
	B—STANDARD CARRIAGE BOLTS (continued). Plow Bolts.
6	A—MACHINE BOLTS.
	B—STANDARD TIRE BOLTS. Round and Flat Head Stove Bolts.
7	A—PHILADELPHIA CARRIAGE BOLTS.
	B—PHILADELPHIA CARRIAGE AND TIRE BOLTS.
8	A—SQUARE AND HEXAGON NUTS. Wrought Washers. Size of Bolt, size of Hole, Width, Thickness, number in 100 pounds.
	B—COACH or LAG SCREWS. Superior and Norway Axle Clips.
9	A—BRIGHT SCREW HOOKS. Belt Hooks. Blake's Belt Studs.
	B—BRIGHT SCREW EYES. Gate Hooks and Eyes. Cornice Hooks and Eyes.
10	A—PLATE CASTERS and BED CASTERS.
	B—WROUGHT HOOKS and STAPLES. Trap Door Rings. Hasps and Staples, and Staples only.
11	A—SAWS, Hand, Panel and Rip. Combination and Back. Diss. ton's and W. M. & C. C's corresponding numbers and "Our Brand."
	B—SAWS, Back, Compass, Pruning, Kitchen, Butcher's Bow and Blades, Framed Wood Saws and Blades.
12	A—CHISELS. Sicks, Socket Framing, Socket and Tanged Firmer, Corner.
	B—Turning Chisels and Gouges, Socket and Tanged Firmer Gouges.
13	A—Cast Stool Augers and Bits. Boring Machine Augers. Jennings' Auger Bits.
	B—Bit Stock Drills. Gimlet Bits, German Pattern, Double Cut and Countersink. Center Bits. Clark's Expansive Bits.
14	A—HAMMERS. Ads Eye, Bell Face, Joiners', Steel Face and Claw, Riveting, Farriers', Blacksmiths', Machinists', Engineers'.
	B—HAMMERS. Tack, Masons', Sledges, Miscellaneous. HATCHETS. Shingling, Lath, Half, Claw, Broad or Bench, Hunters'.
15	A—FILES. Bastard, Mill, Flat, Hand, Half-Round, Round, Square, Kuite, Warding, Second Cut, Mill, Flat, Hand, Half-Round, Smooth, Flat and Hand.
	B—FILES. Smooth, Half-Round, Round, Cabinet, Pit Saw, Hook Tooth, Gin Saw, Band Saw, Cant, Taper, Stubb's Taper. RASPS, Cabinet, Wood, Shoe, Horse.
16	A—Rubber and Hemp Packing. Gaskets or Rings. Rubber Hose.
	B—Leather and Rubber Beating.

SAWS.				
DISSTON'S NO. 3. PANEL, HAND & RIP. W. M. & C. NO. 12.				
Length In.	List.	Cost.	Job.	Sell.
16				
18				
20				
22				
26				
28				
DISSTON'S NO. 7. PANEL, HAND & RIP. W. M. & C. NO. 25.				
Length In.	List.	Cost.	Job.	Sell.
16				
18				
20				
22				
26				
28				
30				
DISSTON'S NO. 8. HAND AND RIP. W. M. & C. NO. 26.				
Length In.	List.	Cost.	Job.	Sell.
26				
28				
DISSTON'S NO. D. B. HAND AND RIP. W. M. & C. NO. 27.				
Length In.	List.	Cost.	Job.	Sell.
26				
28				
30				
DISSTON'S NO. 12. HAND AND RIP.				
Length In.	List.	Cost.	Job.	Sell.
26				
28				
OUR BRAND.				
PANEL, HAND AND RIP.				
Length In.	List.	Cost.	Job.	Sell.
16				
18				
20				
22				
26				
28				
SPECIAL C. S. PANEL AND HAND.				
Length In.	List.	Cost.	Job.	Sell.
16				
18				
20				
26				
COMBINATION HAND.				
Length In.	List.	Cost.	Job.	Sell.
26				
DISSTON'S NO. 1. BACK. W. M. & C. NO. 5.				
Length In.	List.	Cost.	Job.	Sell.
10				
12				
14				
16				

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DESCRIPTIONS AND PRICES.

Card No.	Size and Price Per Card.
17	A—WINDOW GLASS. List Prices and No. Lights per Box. Also ruled columns for other Wholesales and Retail rates. 6 x 18½ in. 40c.
	B—SASH, DOORS AND BLINDS. List Prices.
18	A—HINGES, Strap, Light and Heavy. T, Light, Heavy and Extra Heavy. Hinge Hasps, Screw Hook and Strap. 3 x 13½ in. 30c.
	B—SCREW HOOK AND EYE HINGES. Barn Door Hangers, Checked Back, Kidder's, Anti-Friction, Wrought Frame. Barn Door Backs, Rollers, Rail, Pulley, Latches. Sliding Door Rail.
19	A—WROUGHT BUTTS, NARROW, LOOSE PIN, LIGHT INSIDE BLIND. 3 x 13½ in. 30c.
	B—LOOSE PIN BUTTS, PLAIN, JAPANNED AND PLATED TIPS.
20	A—LOOSE JOINT BUTTS, PLAIN, JAPANNED AND PLATED TIPS. 3 x 13½ in. 30c.
	B—TABLE HINGES, BRONZED IRON BLIND BUTTS. BRASS BUTTS, NARROW, MIDDLE, BROAD AND DESK. WIDTH WHEN OPEN GIVEN OF ALL.
21	A—DOOR BOLTS, BARREL, SQUARE SPRING, FOOT, CHAIN. 3 x 13½ in. 30c.
	B—DOOR BOLTS, FLUSH, NECK AND MISCELLANEOUS KINDS.
22	A—SCREW DRIVERS, FLAT AND ROUND BLADE, RATCHET, CLARK'S. SCREW DRIVER BITS. COUNTERSINKS, REAMERS, BELT OR SADDLERS' FUNCHES.
	B—RULES, WRENCHES.
23	A—HOOKS, COAT AND HAT, WARDROBE, SCHOOLHOUSE, HARNESS, CLOTHES LINE. 3 x 13½ in. 30c.
	B—SHELF BRACKETS, DRAWER PULLS.
24	A—WOOD PLANES, PIANO IRONS, CUT AND DOUBLE. 3 x 13½ in. 30c.
	B—PATENT PLANES. PATENT PLANE IRONS.
25	A—WOODENWARE AND BASKETS. ALPHABETICALLY ARRANGED. 7 x 22 in. 70c.
	B—WOODENWARE (CONTINUED). ALPHABETICALLY ARRANGED.
26	A—PIECED TINWARE. ALPHABETICALLY ARRANGED. 7 x 22 in. 70c.
	B—STAMPED TINWARE. ALPHABETICALLY ARRANGED.
27	A—JAPANNED TINWARE. ALPHABETICALLY ARRANGED. 7 x 22 in. 70c.
	B—GRANITE OR AGATE IRONWARE. PLANISHED WARE, STOVE AND HOLLOW WARE. ALL ALPHABETICALLY ARRANGED.
28	A—MORTISE DOOR LOCKS, LATCHES, KNOBS AND ESCUTCHEONS. 7 x 22 in. 70c.
	B—RIM DOOR LOCKS, LATCHES, &c.
29	A—PADLOCKS, JAPANNED, WROUGHT IRON, BRONZED IRON, BRASS AND JAIL. 6½ x 22½ in. 70c.
	B—COMPLETE COMPARATIVE LIST OF CORRESPONDING NUMBERS OF PADLOCKS, MALLORY, WHEELER CO., WM. WILCOX MFG. CO., RUSSELL & ERWIN MFG. CO., NORWICH LOCK MFG. CO., NIMICK & BRITTAN MFG. CO. REVISED TO JULY, 1885.
30	A—CABINET LOCKS, DRAWER, CHEST, CUPBOARD AND TRUNK. CABINET KEYS. 7 x 24 in. 70c.
	B—COMPLETE COMPARATIVE LIST OF CORRESPONDING NUMBERS OF CABINET LOCKS, EAGLE, CORBIN, PARKER, GAYLORD. REVISED TO JULY, 1885.
31	A—LENGTH AND NUMBER OF NAILS TO THE POUND. NUMBER OF FEET IN A BUNDLE OF HOOP, SCROLL AND BAND IRON. NUMBER OF FEET OF WIRE IN A POUND. COIL OR CABLE CHAIN, WEIGHT PER 100 FEET AND PROOF IN TONS. BRIGHT COIL AND HALTER CHAIN AND CORRESPONDING NO. OF WIRE. SASH WEIGHTS AND LINES REQUIRED FOR COMMON SIZED WINDOWS.
	B—MISCELLANEOUS TABLES. SHOWING NUMBER COPPER RIVETS AND BURS IN A POUND. SIZE OF SKATES COMPARED WITH SHOES. SCALE BEAMS, POLES OR WEIGHT FOR EACH. BRASS KITTLES, SIZE, WEIGHT AND CAPACITY. STRAP AND T HINGES, WEIGHT AND NUMBER PACKED IN A BARREL. COMPARATIVE NOS. OF LEADING MAKERS OF RULES AND LEVELS. REVISED TO JULY, 1885. MANILA ROPE, FEET IN A POUND, WEIGHT OF COIL, BREAKING STRAIN, &c.
32	IS ADAPTED FOR FILLING IN WITH ANY LINE OF GOODS. IT IS RULED BOTH SIDES WITH COLUMNS HEADED RESPECTIVELY "DESCRIPTION," "SIZE OR NO.," "LIST," "COST," "JOB," "SELL."

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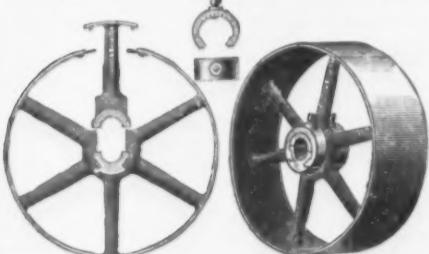
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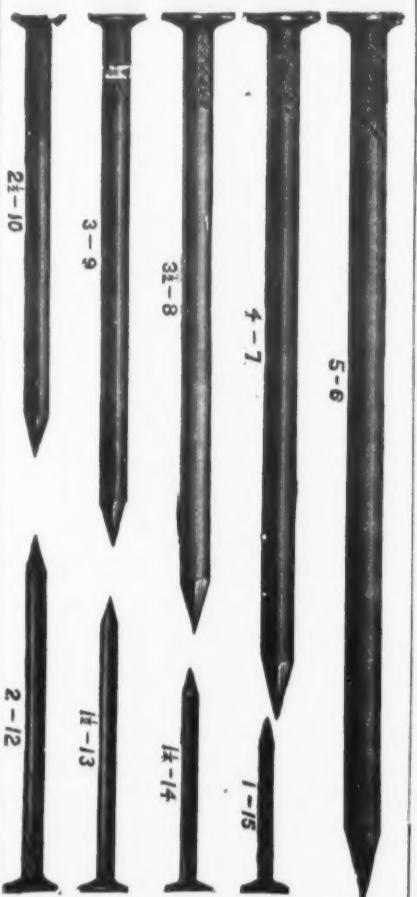
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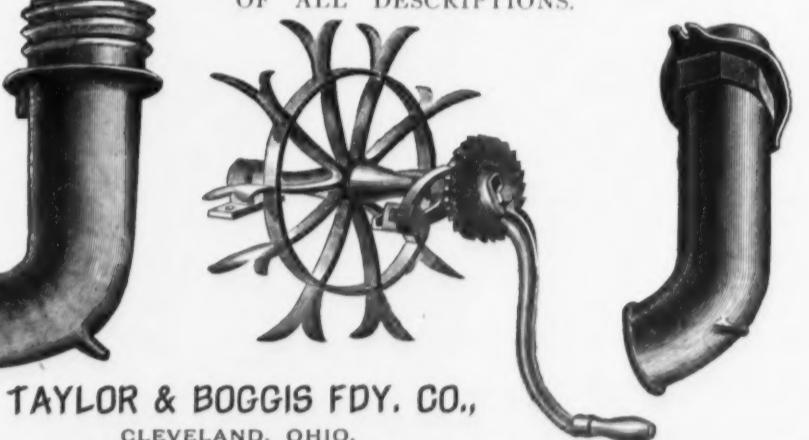
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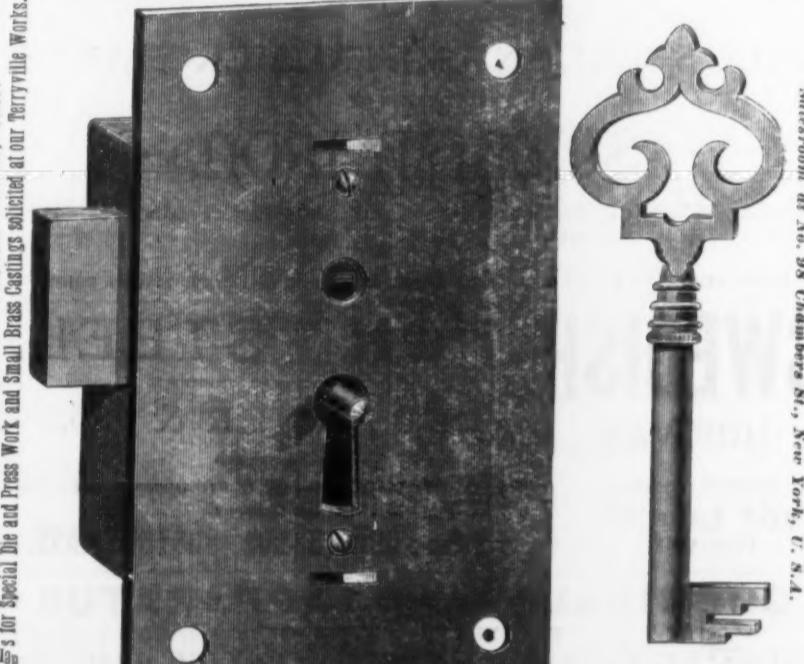
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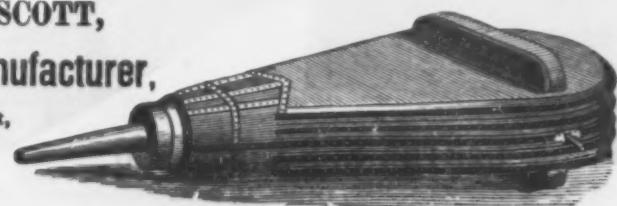
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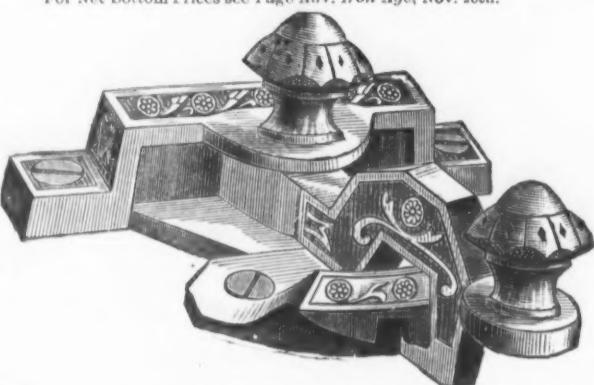
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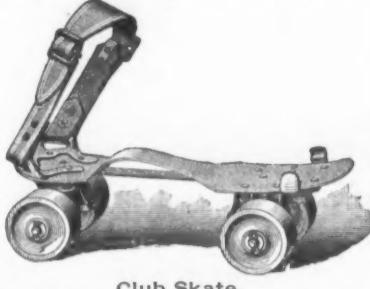
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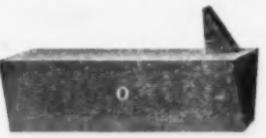
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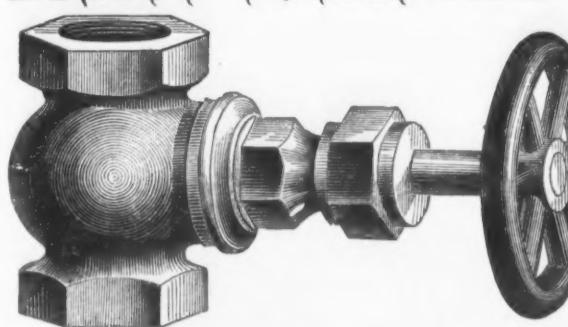


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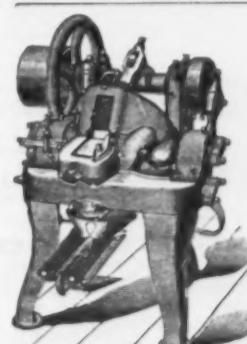
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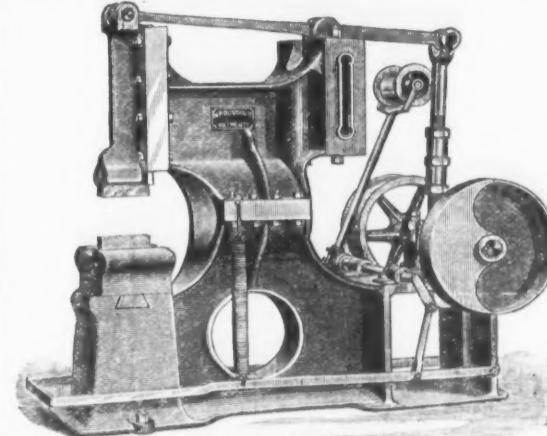
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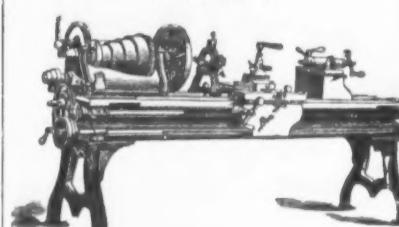
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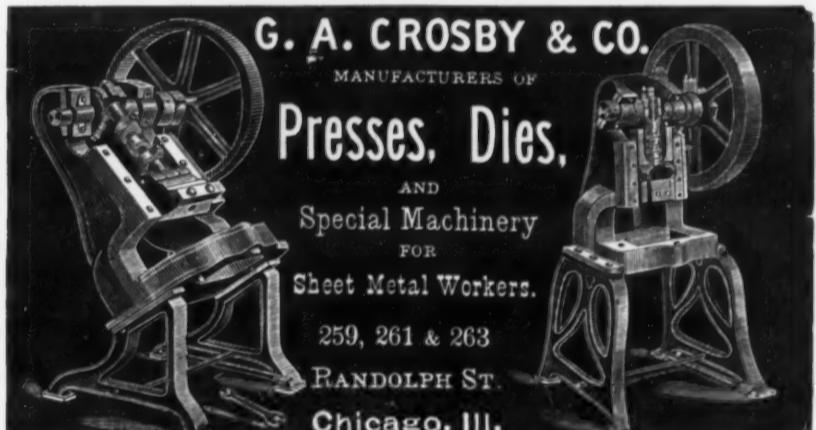
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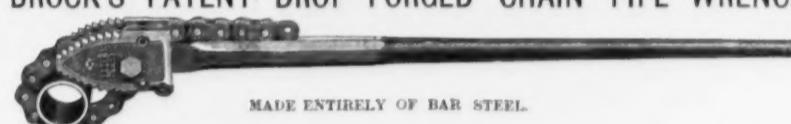
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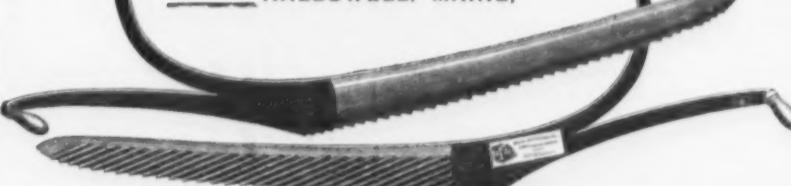
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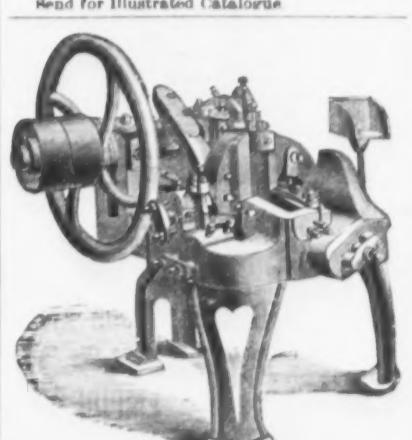
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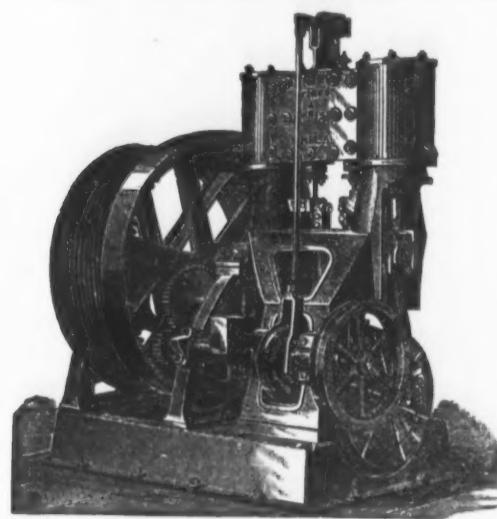
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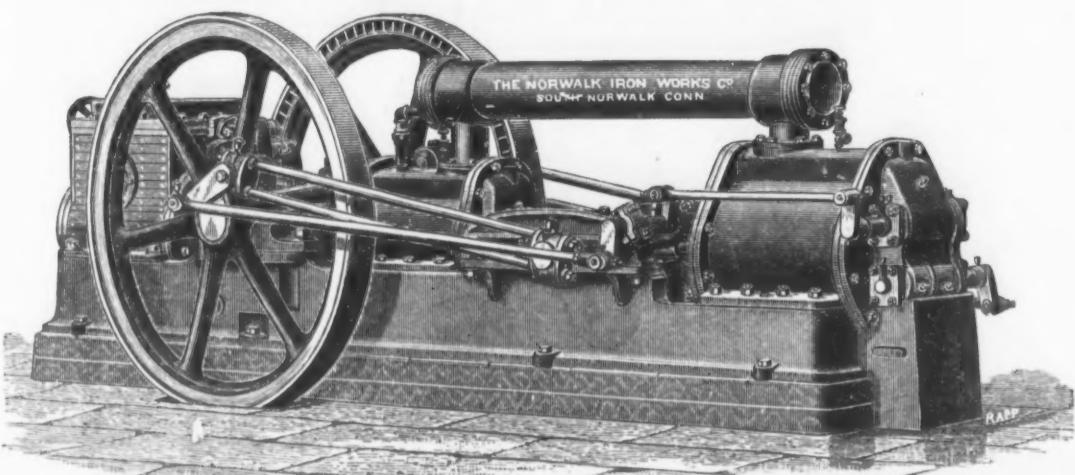
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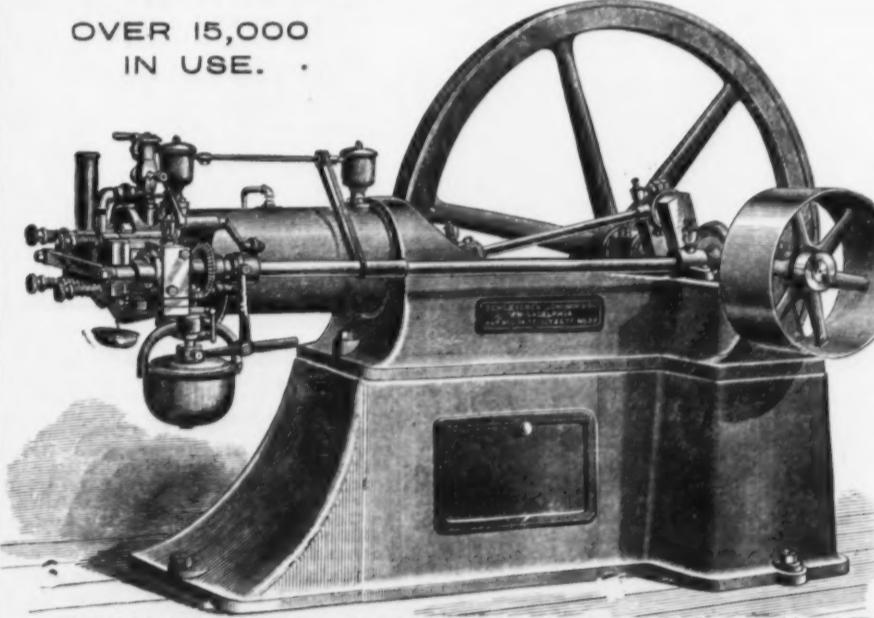
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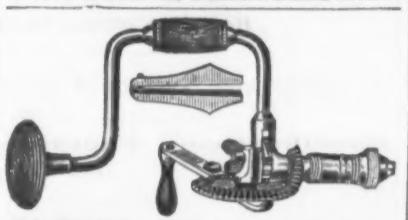
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(From the Engineering and Mining Journal, Aug. 8, 1885.)
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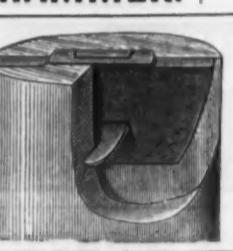
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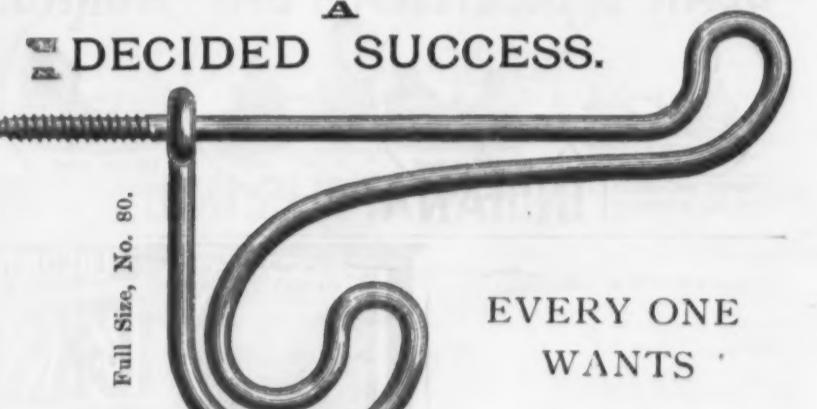
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